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APRIL 1986 VOL. 8 NO. 4
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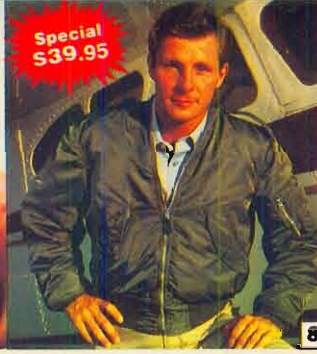
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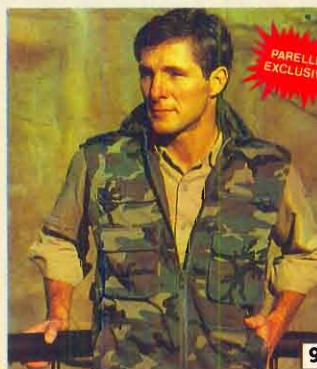
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COVER:

You can win this SAR-48 .308 caliber battle rifle from Springfield Armory in ASG's 1986 Giveaway. See details on page 78, and a review of this FN FAL remake on page 35 (Photo by Martin Hasa). Inset photo: PSE Sportfire and Flashfire crossbows. See page 56.

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TO THE POINT

Who's a survivalist? . . .

SURVIVALIST." It's a dirty word to some people. They see images of camo-clad, gun-waving fanatics and criminals whenever it's mentioned.

It seems—if you believe everything you read/see/hear in the news media—that there are a lot of criminals, racists, right-wing extremists, psychos, and assorted other undesirables displaying poor judgment and bad character, who consider themselves "survivalists."

Unfortunately for the rest of us interested in survival, these individuals are big attention getters for the media. Let's face it. The extreme, the eccentric, the bizarre sells and sells well in the media. It's not surprising that survivalists get a lot of bad press.

It's also not surprising that many people interested in survival don't want to be called survivalists.

But to the readers of this magazine and its staff the term "survivalist" means something much better and positive than the dreadful images some benighted people conjure up.

To the *ASG* staff, a survivalist is merely someone who studies and/or practices how to survive one or more threat/danger/problem. We're not ashamed to be called survivalists, but we don't want to make too much of the term either. It's just a convenient way of describing those interested in the subject. Survivalists are students of survival. Period.

Even if survivalists didn't have a media image problem because of what some have called the "lunatic fringe" of the survival movement (if it can be called a true movement), they would still have a media image problem. That's because many survivalists are involved with firearms, and firearms of course are considered inherently evil things by the anti-gunners. And some anti-gunners are fanatics themselves.

Consider what sociologist William R. Tonso wrote about gun control in a recent issue of *REASON* magazine: "Today's gun control battle, like those of days gone by, largely breaks down along class lines. Though there are exceptions to the rule, the most dedicated and vociferous proponents of strict gun controls are urban, upper-middle-class, pro-big-government liberals, many of whom are part of the New Class (establishment intellectuals and the media), and most of whom know little or nothing about guns and the wide range of legitimate uses to which they are regularly put. Many of these elitists make no secret of their disdain for gun owners."

Yes, survivalists have quite a media problem. But fortunately, I think, most of the public see through all the media hype and recognize the value and advantages of using and possessing firearms and the tremendous value of survival knowledge and study.

Nuclear war? Terrorism? Toxic chemical spills? Crime? You name it. There are plenty of threats, dangers and problems to survive and overcome out there. Survival is here and now as well as in an uncertain future.

There are plenty of reasons to be a survivalist. Many people may not call themselves survivalists, but to us here at *ASG* they are survivalists, by virtue of their attitudes and actions. These people are concerned with protecting themselves and their loved ones from whatever might come their way. There's nothing weird or silly about that. We believe that the vast majority of these people are decent, reasonable, law-abiding individuals.

So who's a survivalist? Your next door neighbor; maybe a friend of yours; maybe you; just your average citizen, that's who —Jim Benson.

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SURVIVAL LINE

*Bank failures, hotline upgrade, underground
shelters urged, Goetz case update, proposed
underground missile base . . .*

IN THE February 1986 edition of *American Survival Guide*, Survival Line reported that the number of U.S. bank failures for 1985 would exceed the 1984 record of 78. Final statistics for 1985 have now been released by the Federal Deposit Insurance Corp. They show a record 119 bank failures across the U.S. in 1985. FDIC Chairman L.W. Seidman sees little chance that 1986 will see a decrease in the number of banks closing their doors. In fact, he predicts that 1986 could be as bad or worse than 1985.

Going High Tech—The Washington-Moscow "hotline," established in 1963 after the Cuban missile crisis, is getting a facelift. High-speed computer terminals, printers, and facsimile machines are being installed at both ends of the hotline in order to facilitate the exchange of information between the U.S. and the Soviet Union in a crisis. The new equipment will replace the mechanical teletype machines used previously. Contrary to the "Fail-Safe" image, the hotline is not a direct telephone link between the U.S. President and the Soviet Premier. The system is designed to transmit only printed messages between the two leaders and their staffs.

Teller Urges Shelters—In an appearance before the American Civil Defense Association Dr. Edward Teller has again urged construction of underground bomb shelters to help reduce U.S. casualties in a nuclear war. Dr. Teller who worked on the Manhattan Project and helped design the first U.S. hydrogen bomb, has been given much of the credit for convincing President Reagan to initiate the current Strategic Defense Initiative research program. Dr. Teller, who has been a long-time advocate of civil defense and preparedness, said in his remarks to an ACDA conference that, "to survive a nuclear war is our duty," and that the knowledge that we are prepared to survive is the best guarantee against the Soviet Union initiating an attack.

Goetz Update—The case of Bernhard Goetz, the so-called "subway vigilante," (see *ASG* 5/85) continues to generate debate across the country. In January a New York state judge dismissed attempted murder and assault charges against Goetz, who has admitted shooting four young men on a New York City subway train. The four young men, he said, were about to rob

him and "beat the ---- out of" him. New evidence has come to light concerning both the shooting incident itself and the four alleged attackers whom Goetz shot.

Two of the four have admitted that the group was indeed planning on robbing Goetz. One of the admissions was made at the scene of the shooting and was noted in the logbook of one of the first officers on the scene. For some as yet unexplained reason the officer's testimony was *not* presented to the grand jury which indicted Goetz.

New York Supreme Court Judge Steven G. Crane Jr. held that prosecutors committed "prejudicial error" when they instructed grand jurors about the legal claim of self defense. Crane also said prosecutors withheld exculpatory evidence from the grand jury and that one witness might have perjured himself.

Meanwhile, Goetz was awaiting trial on charges of criminal possession of a weapon and reckless endangerment. His lawyers, citing the evidence mentioned above, were attempting to have all remaining charges against Goetz dismissed.

Two of the four shot by Goetz are suing him for damages.

Surrender Your Handguns—A bill which would prohibit the sale, purchase, and ownership of handguns in the city of Wilmington, Delaware, has recently been introduced in the city council. Should the bill pass, handgun owners in the city would be given six months to surrender their weapons to city authorities.

Missile Survival—The U.S. Air Force is working on a plan known as the "Secure Reserve Force" which would guarantee the survivability of a portion of the U.S. ICBM forces.

The plan, estimated to cost up to \$50 billion, would involve the construction of a vast missile base 3,000 feet beneath the surface of the earth. A network of more than 400 miles of tunnels would be used to house the ICBM's and the support personnel they require. The base would be impervious to nuclear detonations on the surface, and would provide those with sufficient survival supplies for up to a one year stay. The base would also be provided with tunneling equipment of the type used in subway and water tunnel construction, to assure the ability to dig out after an attack. ●

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by Leroy Thompson

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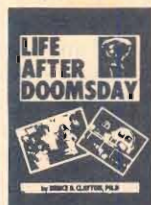


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The 2025 Report, A Concise History of the Future 1975-2025, by Norman Macrae, Macmillan Publishing Company, 866 Third Ave., New York, NY 10022; 258 pages, hardcover; \$18.95.

By the year 2025, according to the author, the threat of nuclear war will no longer exist. Food shortages won't exist. Nor will crime exist. People will live in remote and beautiful spots around the world and work by telecommuting. Macrae, deputy editor of *The Economist* in Great Britain and a noted economist, presents his vision of the future, joining John Naisbitt, Alvin Toffler and the late Herman Kahn in making optimistic predictions about the state of humanity in the decades to come. The book projects a world of freedom, both personal and political. Computers will free all people from geographic restrictions, allowing them to move to and work from locations offering the lifestyles they prefer. Global peace will be assured as a new, libertarian Soviet Union rapidly catches up with the economies and ideologies of the West. In the book the narrator, transmitting on a global telecomputing system from Tahiti in the year 2025, provides an "examination of how and why the tumultuous history of the past half century has come about. In 1975, few people believed mankind could quickly achieve today's comfort, ease, abolition of crime and freedom of living styles. Moreover, mankind very nearly didn't. This is an examination of why what happened did, and why what could have happened was mercifully avoided." The author's premise rests on the belief that human beings are essentially good and sensible and that this goodness and rationality will be fortified by education. The narrator's descriptions and analyses, while fiction, provide exciting, provocative reading.



Nature Bound Pocket Field Guide, by Ron Dawson; OMNIgraphics Ltd., 520 W. Franklin, Boise, ID 83702; 335 pages, paperback; \$12 plus \$1.50 postage and handling.

Hailed as "the 'go along' handbook for the North American field and forest," this 4½- by 5-inch, 9-ounce book is that and much more. It's crammed with valuable survival information that can be as useful in your backyard as in the wilderness. The book is divided into four sections covering survival how-to, edible plants, poisonous plants, and first aid and medicine. The first section has information on fire starting, shelter, temperature and wind chill factors, water, food, snares and deadfalls, fishing, travel, compass reading, map orientation, emergency signaling, cord and rope making, knots, weather and climate facts, and making snowshoes. The second section deals with 80 edible plants found mostly in temperate North American accompanied by high quality color pictures of each plant. The plants are identified by common name in alphabetical order and are cross-referenced by scientific name. Information on preparing and eating the plants and their nutritional value is included. The third section covers about 35 species of poisonous plants found in North America—divided into two parts, one dealing with plants causing internal poisoning and the other dealing with those plants causing contact poisoning. A color photograph of each plant accompanies the information on each one. The fourth section deals with first aid and medicine in the wilderness, including life saving procedures, survival health and hygiene, and extensive first aid procedures. There follows a list of necessary gear, a glossary of terms and an index. The book, produced in cooperation with military and civilian experts, is a worthy addition to a survival/outdoors library. ●

From Lifeknife, Inc.:

The Folding Lifeknife

'The world's first folding hollow-handle survival knife . . .'

Staff Report

THE FOLDING LIFEKNIFE is billed as "the world's first folding hollow-handle survival knife." And as far as this magazine's editors can tell, this is indeed true.

This knife is well made, with a locking 3½-inch 440 stainless steel blade that is razor sharp out of the box. The back of the blade is a handy saw.

The Dupont Zytel handle is contoured to fit the grip of the fingers. Inside the handle, separated in two storage areas, a suture, scalpel, disinfectant, butterfly bandages, needles, hooks, line, sinkers, snare wire and matches that come with the knife can be stored. You can add what you want. The handle is sealed by a buttcap with an O-ring and a luminous liquid

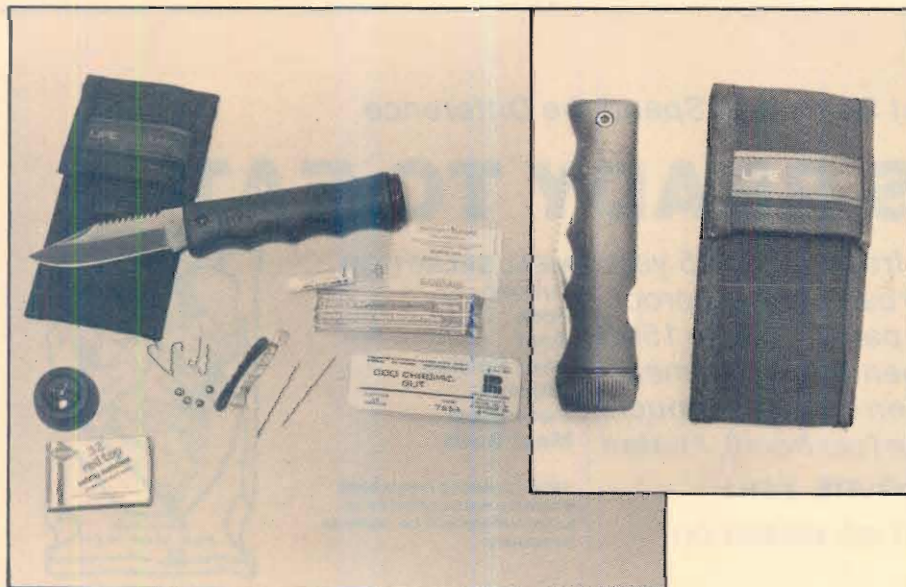
compass.

The knife comes with a sturdy Cordura nylon belt pouch with velcro closure and 2½-inch belt loop.

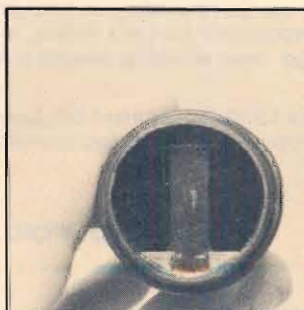
On the outside of the handle are international ground-to-air signals and Morse Code symbols.

While the Folding Lifeknife is strong, like any other folding knife, it is not meant to be used as a pry bar or a lever.

Lifeknife, Inc., Dept. ASG, P.O. Box 771, Santa Monica, CA 90406, offers a 30-day limited warranty on the Folding Lifeknife. It can be ordered for \$29.95 plus \$3 shipping and insurance from Lifeknife, Inc., or from a number of retail outlets and mail order companies. ●



On the handle are international ground-to-air signals and Morse Code.



Storage space is divided into two compartments.

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MAIL CALL

Gas Masks

Duncan Long has written a very interesting, generalized article ("Gas Masks" November 1985). I am sure, given the space, the extensive research he has done would have produced an article that deals with specific protective measures based on the type of contamination faced or with several of the numerous other gas masks available, i.e., the British model that protects a person with a full beard, which the M17, M17A1 or M17A2 do not provide for. The sentence, "if you can travel quickly out of a contaminated area" is not well explained. Travel time being the error. The high probability of all major and minor escape routes being wall-to-wall vehicles, making it necessary to use third level roads or trails that are longer and slower to travel on. A longer time in a contaminated area means protection time needs to be more complete. The protective chemical suit and glove can be expensive if new or from a rip-off surplus company. There are several alternatives: the rubberized suit, pull-on rubber boots and Playtex rubber gloves, to name a few. The M17

and M17A1 and A2 masks offer an attached protective hood. It takes 9 seconds to put the mask on and another 4.5 or less seconds to pull the hood in place and seal it. There was a lack of explanation on the procedures to clear and check a mask. This could be a problem for someone without military training.

Roger P. Redpath
Phoenix, Arizona

We never claimed to be providers of the last word on survival knowledge. Duncan Long did an excellent job in the space available for his article. It's up to the reader to pursue the subject further. We can't provide all necessary knowledge, but we can provide some of it. And we'll be doing more on gas masks.

Hollow-Handle Knives

I am writing you concerning the hollow-handled survival knives that have become such popular items. I feel these knives are fine for storing a few extra small supplies, but not enough to get a person through any

extended survival situation. The minimum amount of equipment I carry when hiking is a knife, canteen and a survival/first aid kit which is contained in a small pouch. I think that if anyone were ever lost, they would get lost with all of their supplies or unexpectedly with nothing at all. I would rather carry my survival kit in a separate container rather than in the handle of a knife. I'd like to hear what you think about this subject and also, which one of these survival knives you say is the very best.

Robert Morris
Riverside, California

We don't like to make statements like that, Robert. The knife that is "the very best" depends on the eye of the beholder. The knife that gets the job done when you need it is the best knife. But if your knife fails you, you could be in real trouble. We find that while some of the hollow-handle knives are little better than junk, some of the newer models that have come onto the market are pretty good. One major drawback of hollow-handle knives has been a lack of strength when these knives are used

(Continued on page 14)

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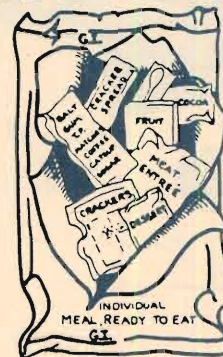
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The Israeli Masks are not only new (meaning they have not been used) but also are of recent manufacture. Made for the Israeli population to protect against gas attacks, they will handle all common battlefield gases including CBW gases. One important feature is that the filter can be changed in seconds without removing the mask. The canisters have no listed limit to shelf life. In talking to those who seem to know, if the protecting seals are not removed they should store indefinitely. Also the filters are readily available at this time. #C/0569

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Sportsman's Handgun:

.22 Magnum Kit Gun

S&W's Model 651 in stainless steel is smooth, accurate and attractive . . .

Staff Evaluation



Decent groups were obtained from 25 yards with the Model 651.

AN OUTDOORSMAN'S handgun—unless it's a specialized hunting tool—is generally more of a constant companion or secondary arm to the hunter, fisherman, or hiker. It should be compact, unobtrusive, and yet possess sufficient accuracy for supplemental small game hunting and informal target practice and plinking.

Not being a primary hunting piece, its uses perhaps consist of taking small game around camp, eliminating pests, or idly shooting at a tin can during slack times.

A rimfire is probably the best choice from a logistical standpoint. You can carry more rounds in less space for less weight if you're packing in. Noise level is also a consideration, particularly if you plan on big game hunting in the area. The *pop* of a rimfire is fairly unobtrusive.

The revolver vs. auto debate—while less likely to engender as much heated controversy as it does in the area of self defense—is still worth considering. As far as we've been able to ascertain, the advantages of an auto are these:

(1) It's easier, generally speaking, to perform routine cleaning and maintenance on an auto under primitive conditions. It is easier to replace broken parts on an auto—

assuming you have spare units available—than it is on a revolver.

(2) Autos are generally flatter in configuration and slightly more compact than revolvers.

Revolvers also have their share of "plus factors" as well:

(1) They permit a wider latitude of loadings. They'll handle cartridges with different bullet configurations and styles that might cause an auto to malfunction.

(2) In the repeated "holstering/unholstering" scenarios of small game hunting and plinking, a revolver handling is less complex. Once fired, there's an empty chamber under the hammer. Under conditions of cold and/or excitement, it can be difficult to remember to clear an auto's chamber before reholstering. We'd rather clear it, than trust the sometimes miniscule safety catches on many .22 autos. This, to our way of thinking, is one of the major factors in favor of a wheelgun in small game hunting situations—where several shots may be fired in the course of an outing. We realize, of course, that this is a highly subjective "conclusion," and that the woods are full of experienced shooters who operate autos with complete safety and success.

According to Roy Jinks, in his encyclopedic *History of Smith & Wesson*, S&W first introduced the .22/32 Kit Gun in 1936. It was (and is) a 4-inch barreled version of the .22/32 Target Model. The term "kit" signified that the gun was designed to be carried in "the hunter's or fisherman's travel kit."

The "32" in .22/32 indicated that the piece was built on a .32 caliber frame—which is compact indeed. Modern members of the series include the J-Frame Model 32 (blued) and the Model 63 (stainless).

The year 1960, saw the advent of Winchester's .22 Magnum Rimfire round, and most handgun manufacturers were quick to realize its ballistic and sales potentials—as the magic word *magnum* was, in those days, the most effective marketing buzzword around.

.22 Magnum Revived—Recently, the company has revived the .22 Magnum Kit Gun, and combined it with the obvious advantages of stainless steel. It's called the Model 651, and sports a 4-inch barrel, square-butt, and excellent adjustable micrometer rear sight.

An odd sidelight to this development is the introduction of a sort of "mini-service revolver" version of the Model 651. This one is a fixed-sight, round-butt, 3-inch barreled item called the Model 650. It's not totally clear to us what the intended purpose of such a variation would be—unless it's designed to be a sort of "combat companion piece" to the Model 651.

Anyway, the whole concept of a stainless steel Kit Gun is terrific—something that'll survive tackleboxes, downpours, and sweat. The concept of a .22 Magnum stainless Kit Gun is slightly less so. Let's start from the top:

The .22 Magnum needs a 6 or 6½-inch barrel in order to obtain peak efficiency out of a handgun. A tube that long will enable the shooter to get velocity in the 1,450 to 1,500 fps range. Out of a 4-inch barrel, it's doubtful if the .22 Mag will significantly exceed some of the standard-length, hyper-velocity .22 Long Rifle rounds such as the Stinger, Yellowjacket, or Spitfire.

Splitting hairs about ballistics when talking about short-range rimfire "trail guns" might seem a bit on the nitpicky side. The question does, however, assume *some* significance when you compare the price of .22 Mag ammo (\$5 to \$7 a box) to Long Rifle stuff (which runs from 80¢ to 90¢ a box on up to \$1.75 to \$2.25 for the hyper-velocity brands). There is a convertible .22 Long Rifle cylinder option for

the Model 651—but it's just that. An extra.

The Model 651 costs around 345 bucks "as is." An optional cylinder would be nice, but anyone serious about going the convertible route would probably get a Ruger Single-Six—which you can convert instantly, without tools, and that has the extra cylinder included in the package from the beginning.

This isn't meant to be a condemnation of the Model 651. It's a terrific little revolver—smooth, accurate, and attractive as hell. We're just not too sure about the practicality of a 4-inch .22 Magnum. Once again, that's just a subjective gripe. If you just plain like the .22 Mag—and it is a first-class small game load—and don't mind a bit of extra expense and noise—then the Model 651 represents the best, most compact double-action .22 Magnum to be had.

Testing—Anyway, whatever our theoretical complaints about the gun were, they were somewhat dissipated at the range session. Shooting was done under very gusty, cold conditions. We chose to use Federal's .22 WMR hollowpoint ammo—which, along with CCI, Winchester and Germany's RWS—represents the brands available.

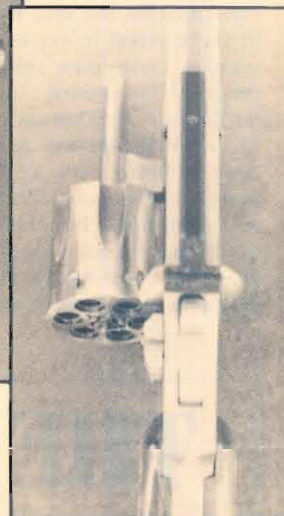
At 25 yards, we managed a few 5-shot clusters of around an inch and a half. Ten-shot groups, by and large, averaged around 2½ to 3 inches.

The single-action trigger pull was a wonderfully crisp 4 pounds. That, and those highly visible sights with an orange insert on the front ramp, enable some very decent results with a lightweight (24½-ounce) revolver firing a cartridge not designed for match grade performance. The double-action pull was very smooth—no hitches or glitches—and broke at around 14 pounds.

It's difficult envisioning a situation where rapid, double-action fire from a handgun of this type would be called for, but you never know. Anyway, the best handgun to have in an emergency is the one you *have* at the time—or something to that effect.

Handling, pointing, and shooting characteristics of the Model 651 were super. It's nice to see a "sporting" J-Frame—most members of that size group are 2-inch .38 "belly guns."

One final point that should be brought up is something we've noticed on other double-action .22 Magnum revolvers. After 30 or 40 shots, we experienced a slight difficulty in closing the cylinder—which, we found, was due to bits of unburnt powder getting between the ejector ratchet and cylinder face. When things get sticky, use a solvent soaked toothbrush to clean things up. It appears that the larger powder capacity of the .22 Mag can create **fouling problems**. We haven't noticed this on single actions, but it seems to be a factor with the more complex ejection system of a swing-out. ●



ABOVE & RIGHT—The Model 651 is a stainless steel J-Frame revolver with swing-out type cylinder. Rear sight is an adjustable micrometer click type. Front sight is a ramp with orange plastic insert.



LEFT—The gun is small and lightweight (24½ ounces). It fires in the single-action and double-action modes.

S&W MODEL 651: TECH SPECS

Caliber	.22 Magnum (.22 LR cylinder available as option)
Action	double action revolver
Capacity	6
Barrel length, inches	4
Overall length, inches	8 5/8
Weight, ounces	24 1/2
Sights	micro adjustable rear, serrated ramp front
Stocks	checked walnut, square butt
Finish	stainless steel
Price, suggested	\$345
Manufacturer	Smith & Wesson

2100 Roosevelt Ave.
Springfield, MA 01101

MAIL CALL

(Continued from page 10)

as levers or pry bars. Some of the new hollow-handle knives are very strong in this respect. Those who prefer the hollow-handle types must decide for themselves if these knives will meet their needs. We will be running more articles on this subject.

Informative

Michael Pietrantonio's "State of Emergency" article in the February 1986 issue of *ASG* was very well researched and presented the material quite well. It is one of the best pieces so far in *ASG*. "Emergency Medical Kits" by Michael Cammisa was also very informative and deserves serious consideration not only by those interested in the survival movement but by all who venture forth into environs having the potential for trouble. In "Radio for Self Sufficiency" by Thomas Cox I felt that the use of VHF Marine radios should have been included. The VHF Marine equipment is not for general land use under current conditions, but could in the event of hard times be quite useful. There are now several low-cost mobile and portable units available that feature over 70 program-

mable channels that could be used to increase the users' security by allowing frequent channel changes according to prearranged plans. The February issue was very informative.

Don Dineen
Montesano, Washington

Glad you liked it, Don. There are always things we would have changed in every issue if we'd had more time, foresight, etc. But on the whole, we thought the February issue was OK.

Non-Lethal Weapons

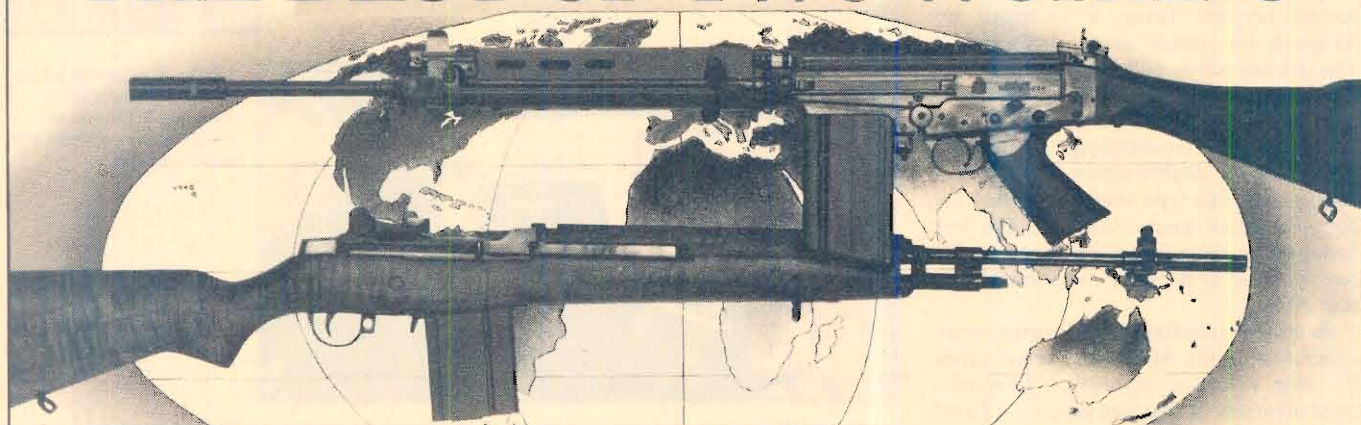
I saw your article about the steel whip in your recent issue (February 1985). I would like to see more articles on non-lethal defense weapons. Survival is right now, not some day in the future, after some crisis has occurred. Too many people fear to use deadly force until all other means have been exhausted. Often waiting until it is too late. With the non-lethal type weapons you can make a mistake and it's not permanent, so you are more willing to act first

and check very carefully later. There is a device that has the power of 250 flashbulbs going off at once, but it can be used again and again. This will cause up to eight hours of total blindness if used at night. I don't know what the name of this device is or the company that makes it, but I do know it is for real, because I saw one once and it is not homemade. I would greatly appreciate information about this device and where to purchase one for my home defense. Perhaps an article about them would fit into your publication. Keep up the good work.

Ken Davison
Copper Center, Alaska

Sorry but no one here knows of this device you mention. If we come across information about it we'll pass it on to you. It's interesting that the steel whip which you referred to is called a non-lethal defensive weapon yet some states regard it as very dangerous. In California, the steel whip is not sold to the general public, and a lawyer advised one of our staff members that to carry the steel whip concealed in California is a felony offense. ●

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PDRM 82 features:

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features (MTBF) is calculated to be 24,000 hrs.

- 1 cGy = 1 Rad/Roentgen so there are no complicated conversions
- \$375 ea.



Plessy PDRM 82

NEW PRODUCTS



Woolly Pully

Brigade Quartermasters, Ltd., a leading mail-order firm, introduces the new Stone Grey Tweed Woolly Pully in the company's "Clothing and Equipment Fit for Action"

catalog. Brigade Quartermasters is the exclusive U.S. distributor of the Woolly Pully. "The Stone Grey Tweed will enhance our existing line of crew and V-neck sweaters that range in color from conservative brown to woodland camouflage," said Mitchell WerBell, president of Brigade Quartermasters. "Since the sweater is designed to meet military specifications, the wearer is guaranteed a durable and good-looking garment for years to come." Priced at \$39.95, the Woolly Pully is a heavy-rib knit of 100 percent pure new wool. It features heavy-duty cotton/polyester twill reinforcing patches on the shoulders and elbows. The original Woolly Pully was developed for British commando units during World War II as a replacement for cumbersome jackets. Now, the sweater is used as authorized optional wear by the U.S. Marines, U.S. Air Force, U.S. Coast Guard, U.S. Fish & Wildlife Service, federal and state law enforcement agencies, uniformed commercial companies and many military academies. Brigade Quartermasters' "Basics for Life" products are featured in its free 100-page "Fit for Action" catalog. The catalog is available by contacting Brigade Quartermasters, Ltd., Dept. ASG, 266 Roswell Stret, Marietta, GA 30060; phone (404) 428-1234.



Beeman/HW77 Carbine

Beeman Precision Arms now has a carbine sized version of the Beeman/HW77 air rifle for shooters who prefer the fast pointing ease of a shorter rifle. The barrel and underlever cocking arm of the new Beeman/HW77 Carbine are four inches shorter than those on the regular length version. Like its longer barrel predecessor, the HW77 Carbine combines a cocking underlever with a fully opening, sliding breech block, which is essential to proper pellet loading, according to Beeman. The HW77's walnut-stained, hardwood stock with cheekpiece, rubber buttplate

and cut checkering on the grip gives the rifle a superbly balanced feel. The receiver is grooved for scopes, and the crisp, adjustable trigger lets off smoothly to make accurate shooting easy. This is a true magnum air rifle with velocities reaching 830 fps. Accuracy tests produced five-shot groups 18/100" c-t-c at 10 meters. Available in both .177 and .22 calibers. Suggested retail prices for the Beeman/HW77 Carbine are \$359.50 (right hand) and \$389.50 (left hand). Contact Beeman at 47 Paul Drive, Dept. ASG, San Rafael, California 94903; phone (415) 472-7121.



Mini-14 Folding Stock

RAM-LINE, Inc. has designed a unique, all plastic stock for the Ruger Mini-14 rifle. About half the weight of metal versions, it features innovative styling that makes the Mini-14 look and perform like a totally uplifted weapon. An internal compartment in the "Laser" styled pistol grip holds survival or cleaning gear, while the forearm area has ribs for extra gripping power. Strength is best confirmed by dropping the stock with a barreled action, from 10 feet on concrete. It just bounces harmlessly. And of course, unlike wood, the space-age plastic doesn't absorb water or crack with age. And the "no wiggle" armlock makes for rock-steady aim. It comes equipped with studs for snappy installation of quick disconnect sling swivels and a buttplate which extends the stock length about one inch. At \$62.50, this folding stock converts the Mini-14 into an awesome looking ranch rifle, plinker or survival gun that performs. Contact RAM-LINE, INC., Dept. ASG, 406 Violet St., Golden, CO 80401.



Pocket Binoculars

The makers of Leupold riflescopes and hunting binoculars have introduced new pocket size binoculars designed especially for the hunter. Leupold Pocket Binoculars offer many of the same features as Leupold Porro Prism Hunting Binoculars, but in a size that fits easily in to the pocket of your shirt or hunting jacket. According to Leupold, inside the weatherproof all metal

body is a roof prism optical system that delivers the image definition, light transmission and resolution needed in almost any hunting situation. Individual focusing objectives allow you to focus each eye independently. Positive detents help prevent inadvertent movement of the focus settings. Once focus settings have been determined, further adjustment is seldom necessary over normal distances encountered in the field. Leupold 9X25 Pocket Binoculars come in a choice of finishes—traditional black leather grain or green armor coated. Each has telescoping eyecups that offer comfortable support while viewing. By simply pushing the eyecups in, the binoculars give the eyeglass wearer a full field of view. The 9X25 Pocket Binocular stands 4½ inches high and weighs 10.5 ounces. Each pair comes complete with a matching lined leather carrying case and leather strap. For more information on the Leupold 9X25 Pocket Binocular and other Leupold GOLDEN RING scopes and binoculars, write: Leupold & Stevens, Inc., Dept. ASG, P.O. Box 688, Beaverton, OR 97075.



New Knife

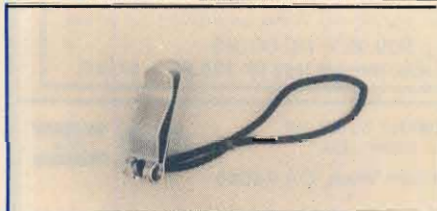
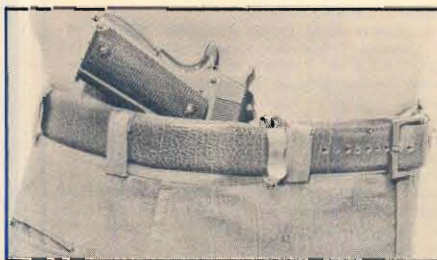
A new handmade hollow handle survival knife is available from Running River Supply Company, Dept. ASG, P.O. Box 4465, Riverside, RI 02915. The knife, selling for \$34.00, features a plain unsharpened blade back with a reduced guard height on top. This is important for precise control for small work, and practical for difficult chores. The blade is 440C, all stainless steel and comes with leather sheath with stainless fittings. The knife is 12 inches overall with a 7-inch blade that is ¼-inch thick. There is a compass in the buttcap. The sheath has unique high ride/low ride belt loops. The knife also comes with sharpening stone, wrist tie, and double duty leg tie and lashing line. For more information send \$1 for a brochure, or order the knife directly from Running River. VISA and M/C ok. Add \$2 for shipping. RI residents add 6 percent sales tax.



Pick-up Cover

The J.G. Wilson Corp., a pioneer in rolling closures since 1876, has introduced the first fully retractable, all-steel cover for pickups. The "Pick-Up Cover-Up" closes easily, securing the entire bed area in seconds. For total access to the bed or cargo area, the cover slides open with the aid of an automatic return spring. Wilson's new product helps protect truck bed contents not only from bad weather, but also from theft. Security is provided by a key-lock T-handle with a double deadbolt on the cover. In addition, a separate sliding deadbolt is located inside the tailgate. The Pick-Up Cover-Up's incredibly tough solid-steel lifetime construction is the only roll-up cover in the industry that you can stand on. It features a 26 gauge, 1¼-inch wide interlocking galvanized steel

slat cover, as well as a .050 formed-aluminum cover plate with custom-extruded aluminum guide rails and locking pull-bar. It can be ordered in either the standard white baked enamel or the optional clear anodized aluminum finish, both rust-resistant. The easily installed cover fits flush-mounted on the bed, enhances the vehicle's appearance without changing body lines, and increases fuel mileage by eliminating tailgate drag. Available in three sizes, the Pick-Up Cover-Up fits almost all truck beds. For more information, write to the J.G. Wilson Corp., Dept. ASG, "Pick-Up Cover-Up," P.O. Box 599, Norfolk, VA 23501-0599, or call either the toll-free number (800) 343-3667, or the commercial number (804) 545-7341.



Gunclip

How'd you like to own a single rig to hold all of your handguns so they fit snugly in your waistband or belt, without adjust-

ment and with better concealment, less bulk and more comfort than regular inside-waistband holsters? And at much less the cost! Impossible, you say? Not at all. What you want is Gunclip, an ingenious little device consisting of a stainless belt/waistband clip, nylon sling and fittings. For police and other law enforcement personnel, Gunclip is excellent for hideaway, back up or undercover guns, for off-duty wear or investigative work. You simply attach the clip to the place on your waist you want to put the gun, slide the gun barrel through the nylon loop and tuck the weapon into your waist band or belt. It's as simple as that. Removal is fast and easy. And the gun is held firmly in place. Gunclip can be purchased at gun stores, or directly from the manufacturer, Gunclip, Inc., Dept. ASG, P.O. Box 740007, New Orleans, LA 70174-0007; phone (504) 392-4141 or (504) 392-1164. The price is \$5.95 each plus \$1 S&H.

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SURVIVALIST DIRECTORY

THIS IS A CONFIDENTIAL listing of survivalists who wish to become known to others of like mind. *American Survival Guide* will accept properly coded mail and forward it to the coded addressees without charge. *American Survival Guide* accepts no responsibility for the contents or results of these confidential communications. Mass mailings are not permitted.

ASG 0401

Lexington, Central/East Kentucky, looking for established group or those serious about starting one or a self-reliant community, should hard times come in this region.

ASG 0402

St. Ignace, Michigan, will help put your plan into action. Assist in retreat maintenance, security, etc. Offering trust, honesty and lifelong alliance.

ASG 0403

Cloverdale, Indiana, want to contact other survivalists in the area to exchange information/ideas and start or join a group.

ASG 0404

Warrensburg, Missouri, looking for survivalist contacts in western Missouri.

ASG 0405

Midway, Pennsylvania, wish to contact other survivalists in Washington and southern Allegheny counties.

ASG 0406

Central Indiana, small survivalist group would like contact with other serious survivalists in Indiana and across the nation to exchange ideas. No para-military types.

ASG 0407

Central Texas, Texas Survival League is seeking potential members or communication with other survivalists. Serious inquiries only, please.

ASG 0408

Waldorf, Maryland, survivalist with many skills in all areas of survival wishes to exchange information.

ASG 0409

Columbia, South Carolina, interested in setting up international communications network for survivalists. Survival oriented individuals of all nationalities should reply.

ASG 0410

Fullerton, California, looking for people to form a survival group in this area.

ASG 0411

Hudson, Wisconsin, would like to contact survivalists in Hudson and surrounding area to possibly form group or join a group.

ASG 0412

Upstate South Carolina, would like to make contact with survivalists in this area and in western North Carolina.

ASG 0413

Vancouver, Washington, couple wish contact with other survivalists, male/female, family/single, in southwestern Washington State and Portland, Oregon, area to exchange information and form group. No racists, nazis, bible-spouters or similar types, please.

ASG 0414

Danbury, Connecticut, would like contact with any survivalist or survivalist group. Would like descriptions of groups and requirements for joining them.

Address response letters as follows:

American Survival Guide

ASG 0000 (Code Number, As Above)

2145 West La Palma Avenue
Anaheim, CA 92801

Your letters will be forwarded to persons listed within two days of receipt. *American Survival Guide* accepts no responsibility for loss or delay of inquiry letters. Contact letters that do not carry the appropriate code number will be discarded.

Those who wish to be added to the directory listing, please send names and addresses to *American Survival Guide*, 2145 West La Palma Avenue, Anaheim, CA 92801. The listing is free.

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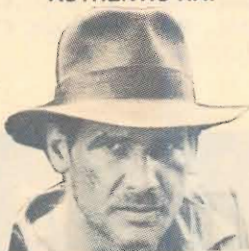
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THE HYPOTHERMIA SUIT from Taymor Industries Ltd., of Toronto, Canada, is designed for cold weather, outdoors use in emergency situations.

This two piece, high visibility, full body suit provides protection against shock and hypothermia in severe weather conditions.

It's made of metalized plastic film, by the same principle as a Thermos Space Blanket. The metalized film reflects body warmth back to the wearer to minimize heat loss. Attached tape strips at the cuffs, neck and waist stick to the suit material for a snug fit. The one size can be adjusted to fit all sizes of wearers. The upper piece has a hood for head protection.

The suit weighs only 14 ounces and fits compactly into its 7½" by 9-inch plastic bag. It can be conveniently stored in a pack, car, truck, boat or airplane, and it is reusable.

An *American Survival Guide* staff member who tried on the suit found it was very effective in retaining body heat—so much so that after only a few minutes inside the suit he was pouring sweat.

Although he was thankful to get out of the suit, the staffer stated he was impressed with it and promptly purchased several suits for his survival needs.

He noted that he had some difficulty in using the adhesive strips on the suit for a snug fit. He felt the adhesive should be stronger. In extremely cold weather the wearer might have difficulty in obtaining a snug fit of the suit if the adhesive strips do not attach firmly to the foil of the suit, the staffer speculated. Perhaps the user could carry string or other material for insuring a snug fit at the wrists, neck, feet and waist.

All in all, the staff believes this is a valuable survival item that could save your life in an emergency. The suit would have to be worn with proper gear for the feet to be fully effective. It fits easily over bulky outer wear or it can be worn nearer to the user's skin for maximum protection.

Unfortunately, these unique emergency survival suits are not being made any more. But Survival, Inc., (SI) in Redondo Beach, California, has a few hundred of the suits left in stock. They have been sell-

ing for \$11.50 each plus \$2 for shipping and handling. Three suits cost \$27.50 post-paid. Contact SI, Dept. ASG, 2322 Artesia Blvd., Redondo Beach, CA 90278; phone (213) 318-2575. ●



The hypothermia suit has one size that fits all. Adhesive strips allow adjustment for a snug fit.



The suit fits compactly inside its 7½" by 9-inch bag and is reusable.




Beginning with the popular, inexpensive Ruger 10/22, you can create the most reliable, inexpensive full auto conversion imaginable just by following the instructions contained in this volume. This conversion allows you the option of *firing up to 1200 rpm on full auto*, or switching to standard semi-auto for precise, aimed shots. Two methods are shown, allowing for different levels of machining skills and availability of tools for the person doing the conversion. Either method works well and both are completely reliable. After performing the conversion (legal with prior BATF approval), why not create a one-of-a-kind weapon by adding some of the neat accessories available for the 10/22? A number of them are shown in the *Ruger Carbine Cookbook* listed below.

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FULL AUTO

Volume One



AR-15 Modification Manual

FULL AUTO


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AR-15 Manual

Step-by-step instructions for converting this popular sporting and survival rifle to full auto. Softcover. 32 pages, illustrated.

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Volume 3
MAC 10 Manual

Covers six different methods of converting the semi-auto MAC to full auto only or select fire versions.

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Semi-Auto THOMPSON Modification Manual

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Complete machinists' drawings show exactly how to alter just 3 original parts to create a Full Auto M1927A1 Thompson!

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FULL AUTO

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RUGER MINI-14

FULL AUTO CONVERSION MANUAL

FULL AUTO


Ruger Mini-14

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RUGER CARBINE

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MINI-14 & 10/22

Theoretical Manual & Assembly Guide


RUGER

CARBINE COOKBOOK

Complete assembly/disassembly instructions for 10/22 and Mini-14, plus "dress up" items for both popular carbines.

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HK91-93 FULL AUTO CONVERSION MANUAL

FULL AUTO


HK91/93

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M1 CARBINE


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GRENADES



EXPEDIENT HAND

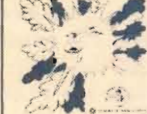
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STEN MK II


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HK94

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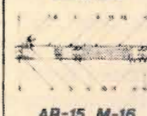
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APRIL 1986/AMERICAN SURVIVAL GUIDE 21

Lightweight, Powerful:

Grendelite A-2 Combat Flashlight

Here's a sturdy, high intensity light for your firearm . . .

By James M. Sammons

THE GRENDELITE A-2 Combat Flashlight is a sturdy, lightweight, high intensity light with applications for law enforcement, survival, search and rescue, hunting, marine and aviation situations, mining and spelunking.

The light, which can be purchased with mounts for rifles, handguns and shotguns, and a remote switch, has an aircraft aluminum case, ABS plastic interior and polycarbonate lens. The light is shockproof and water resistant.

With eight alkaline batteries, the unit weighs just 11 ounces. It is 3.58 inches long and 2.19 inches in diameter. It can be operated continuously for about 110 minutes at low intensity (70 candlepower), or for 70 minutes at high intensity (18,000 candlepower).

Assembly and disassembly are simple if the user follows the instructions provided with the Grendelite. Pay particular attention to assembly of the battery pack and alignment of the arrow with the belt clip. Be careful mounting the lens so as not to strip the threads.

Two tapped holes in the case are provided for the belt clip or gun mounts. The belt clip is removed to allow the rifle mounts to be added.

The lens is injection molded high impact polycarbonate and the ABS reflector is metal coated and parabolic, focusing the light in a concentrated beam.

The battery holder accepts eight AA size cells mounted in series. The holder is injection molded ABS with plated springwire connectors.

The plastic switch tube is housed inside the battery cluster and connects the batteries either directly or through a resistor. The switch is operated by a lever on the rear of the case. The remote switch accessory permits the user to operate the switch further from the case, such as on the stock of a rifle when the light is mounted near the muzzle.

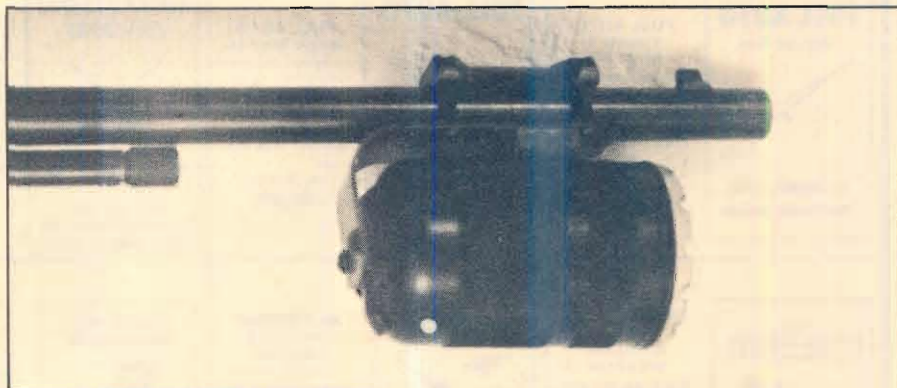
Continuous use of the Grendelite in low light conditions may cause excessive heating. On testing, after the light had been left on for some time, smoke was observed coming from the light, but it did continue

to function properly.

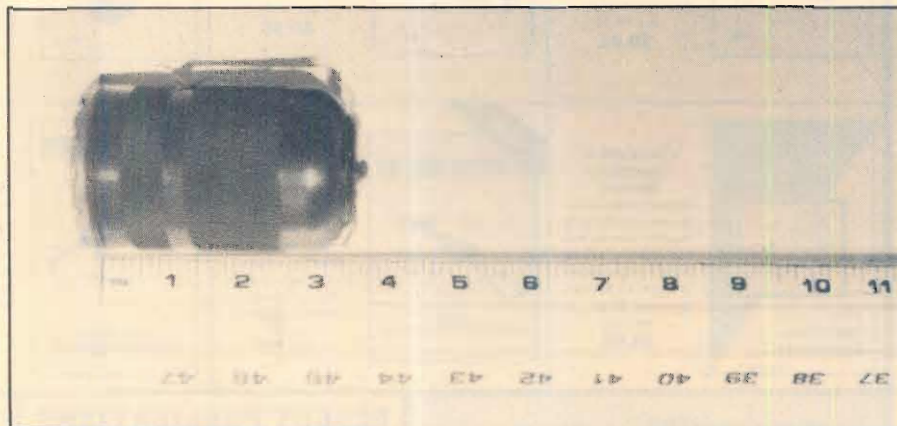
Grendel Company is working on improvements to the Grendelite that would, among other things, eliminate the heating problem. But for now, it's best to remember that the light should not be left

on for prolonged periods.

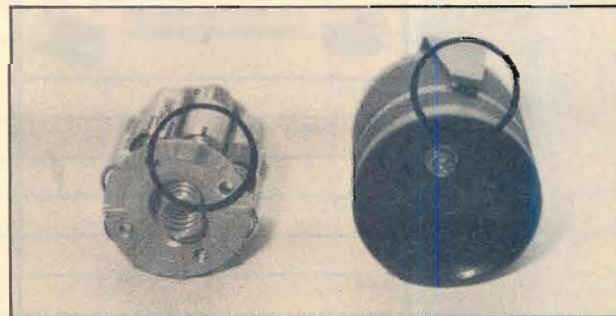
Grendelite A-2 Combat Flashlight is available for \$39.95 plus \$2 postage and handling from Intratec USA, Dept. ASG, 11990 SW 128 Street, Miami, FL 33186; telephone (305) 232-1821. ●



In this photo the Grendelite is attached with a mount to a rifle barrel for hunting, self defense or law enforcement uses.



ABOVE—The Grendelite is less than four inches long.



LEFT—The circles show the mark on the battery cluster and the end of the belt clip which must be aligned for proper functioning.

Air Power:

The People's Pellet Rifles

'Industry Brand' airguns offer low-priced potency...

By Payton Miller

THE LATE MEL TAPPAN, in his book *Survival Guns*, was enthusiastic about the possibilities of high-powered precision air rifles as small game harvesters and pest control tools.

They're cheap to shoot, quiet, and in some cases—possesses inherent accuracy far superior to .22 caliber cartridge rifles. A 500-round tin of .177 pellets is about the size of a tin of Copenhagen snuff, so it follows that a shooter can store around 100,000 "rounds" in a shoebox.

Single-stroke, "barrel cockers" made by outfits like Britain's Webley, or Germany's Feinwerkbau and RWS, are presently engaged in a "velocity race" with several of the .177 models surpassing the 900 feet per second mark.

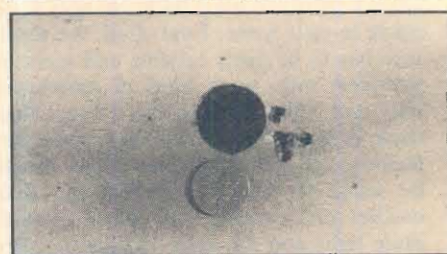
Airguns have always been more popular in Europe, which is partially due to the difficulty in obtaining cartridge guns (try getting a firearms certificate in England for a .30-06 to use on your next stag hunt in the Scottish Highlands!). It only stands to reason that Europeans have managed to bring the air rifle to the "outer limits" of velocity and accuracy.

The old Benjamins, Shendians, and Crossmans most Americans grew up with are usually in the 500 to 600 fps power range, and require considerable time and effort to pump up to those performance levels. As nifty as the old American "pneumatics" were (and still are), they really can't match the *amrad* accuracy, velocity, and ballistic "consistency" of the single-stroke models.

Yep. Those high quality, nicely finished British and German tankdiesers are pretty nifty. There's one catch, however. They're expensive. The real precision zappers are in the \$200 to \$400 price range. Whether or not the American shooter is willing to part with that much loot for what he may or may not classify as an amusing toy, is an interesting question.

Well... there's an interesting sidelight on the import air rifle scene. Midwest Sport Distributors (Lucy Street, Box 129K, Fayette, MO 65248) is importing a trio of single-stroke air rifles, all made in the People's Republic of China, Shanghai, to be exact. They include the Model 61 (650 fps), the Model 62 (700 fps), and the Model B3-1 Magnum (800 fps).

What's remarkable isn't that the Chinese have produced serviceable, powerful air rifles. It's how much they are being



At 30 feet, the Model 62 exhibited fine small game potential.



These rifles may be crude, but they're efficient and powerful.

sold for.

You can buy *all three* models for far less than you'd pay for the cheapest, economy model RWS, Feinwerkbau, or Webley.

The Model 61 goes for \$28.95. The Model 62 goes for \$32.95. The Model B3-1 costs \$38.95.

OK, obviously you're not going to get something with the fit and finish of a German or British model. The Chinese rifles all feature the name "Industry Brand." The stocks appear to be altered military furniture (possibly SKS carbines). The open sights are step adjustable military items with hooded front posts. They are crude, and our test samples were liberally coated with cosmoline.

Are they pretty? No.

Are they powerful? Very.

Are they accurate? Yes. Even with the sights and rather heavy trigger pulls, all three are sufficiently accurate for vermin and small game out to 60 feet or so—which, coincidentally, is about as far out as anyone should attempt to stick something with a 7- to 9-grain pellet anyway. All of 'em shoot "minute-of-me" with our nod going to the Model 62 as the most accurate. Using Chinese-made RN lead pellets (cost: \$7.00 for 2,000) the Model 62 gave

rise groups about the size of a dime at 30 feet.

Yes, we know that there are match grade jobs capable of putting 'em in one hole. These, however, are great for gophers, deer guns, and what have you. The B3-1, incidentally, is every bit as powerful as the high-price items. Using a painted, German-made, 7.7-grain pellet, penetration was rather impressive—averaging over 1/2-inch in plywood at 20 feet. Even the little Model 61 was capable of driving relatively soft round-nose pellets all the way through white pine blocks at the same distance.

All three of these rifles will do what the vast majority of shooters would probably buy an air rifle for, which is to have fun. In a pinch, you can take small, edible game with one. It makes sense to own one, and, quite frankly, we're amazed at the pricing. We should go on record to say that fundamental firearms safety procedures apply in using these rifles. All are capable of causing serious injury if mishandled.

It's very rare these days to get *more* than you pay for. These rifles are definitely worth serious consideration by anyone who has ever considered a high-powered air rifle. ●

Money, Knowledge:

Seven Levels of Self Sufficiency

If you'd just do something you'd be better off . . .

By Carl E. Krupp

WHAT A DIFFERENCE \$50,000 would make! It's an old problem—there's not enough time or money to do all the things you want to get done, yet eventually you have to face the fact that if you'd just do *something* you'd be better off than if you did nothing!

But there are some distinct changes that occur as you get more deeply into the self-sufficiency movement. It almost appears that there are certain levels that can be attained with a certain amount of money and effort, and that then you need to wait until your knowledge catches up to your progress before you can move up to the next level, which usually also requires still more time and money! Amazingly, though, at the outset there's really quite a bit you can do for \$750 to make yourself more independent from the tightly interlocked world we live in.

Level I

This is the basic primary stage of the self-sufficiency movement, where a family decides that being without reserves doesn't make sense. It usually starts with the realization that grocers have only three days of food in the store, so that the slightest problem, such as a good snowstorm, could cause their family to go hungry! Level I consists of seven days of food for everyone in the household, a few gallons of drinking water, candles or oil lamps with fuel for a week, a firearm suitable for defense, and a few pre-1965 silver coins or small gold coins. Depending on how the individuals felt, there might also be some minor preparedness for some specific threat that they foresaw. But generally, Level I is just the beginning of the eye-opening process.

Integral to Level I preparedness is the orientation that "home is where the food is." There is really no commitment to the current structure that is home, for if the authorities suggested the family get in the car and drive a few miles to a safer area, it would be relatively easy to pack a few boxes and suitcases and leave. This low level of preparedness actually has a slight advantage, for Level I participants are still very mobile.

Level II

Most of the change from Level I to Level II is in the area of food reserves. These are the cheapest to buy and the most necessary in troubled times. Another change is that there is more of a commitment to staying in the current residence.

But in order to be more prepared than Level I there are some basic changes to be made in your home. First of all, the structure has to be fairly reliable and must be provided with some kind of emergency heat and toilet facilities for a time when there is no power to run these necessary facilities. In addition, some plans should be made for longer term lighting than candles can provide. Oil lamps provide more light and are safer to operate; they also provide some heat. A gallon of lamp oil will supply several lamps for a month or longer. Besides, the mellow light of an oil lamp can even become your standard dining light in normal times!

But the biggest difference is that the food and water supplies must be increased to a 30-day supply, instead of seven. One medium-sized closet would handle the requirements fully, so the storage requirements are not so severe, nor are the financial demands. Rather it is a more complete commitment to stay in your current residence unless you are forced to move by the authorities. Since this much equipment is still transportable in a normal car, if forced to leave, you could pack it all into cartons and take along. No matter where you and yours go, you are going to need the basics of human survival.

Level III

At some point in time it becomes more apparent that you are going to have to stay in your primary residence during any major dislocation, because the more prepared you get, the more physically bulky the supplies become and the more difficult it is to consider moving them about with you. In truly bad times, household location becomes more important than many other factors. A distant suburban home becomes a far safer place if the nearby city is having riots than is a highrise apartment in a nice

neighborhood within that city. In the event of nuclear war, the comparison is incomparable, for if the suburban home is more than 20 to 25 miles from the downtown city area it is likely to survive a major attack. In addition, city locations can't really hold out very long because they can't be resupplied very easily, whereas fairly distant suburban areas come back to normal more quickly.

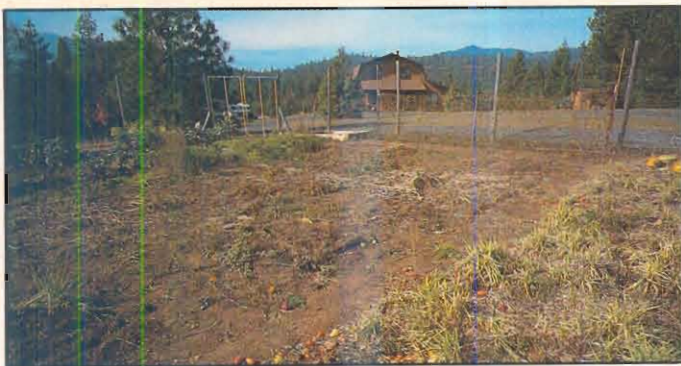
Therefore, if you are a city dweller, one of the major changes from Level II to Level III is moving into a distant suburban home, vastly improving the quality of the sheltering aspect of your home. Also implied is that no one in the household would be working in the major city, requiring the long commute each day, but rather would be working in one of the office buildings or factories in a nearby suburb.

Along with the concept that Level III requires a distant suburban location, it also requires a house that has fairly substantial storage areas. A basement offers an ideal storage facility and it also makes the construction of a nuclear fallout shelter vastly easier.

Level III also requires the food storage program to be greatly expanded—to 90 days of regular food, such as dried and canned foods your family likes to eat, along with a smaller quantity of frozen foods and some fresh foods that keep well, such as root crops and winter squashes. In addition, Level III preparedness should provide at least 90 days of emergency food.

In addition, Level III preparedness requires some ongoing supplies of water and a program for getting rid of waste. This could be as simple as a well with a hand pump in the back yard, so that a supply of potable water was available, and a built-in composting toilet.

In addition, some household organizing is required. An area needs to be set aside in the house for construction of storage shelves and cupboards, so that food and other emergency equipment does not get scattered in every drawer and closet throughout the house. Also, a written plan for defending the property should be made, and some thought should be put into lighting the property both during normal times and when there are no public utilities available. Along with all of that



At this mini-farm in the fall most of the garden produce is harvested and the woodpile is full. Five acres will provide a base for self sufficiency.



A battery of firearms allows you to choose the proper tool for the job to be done.



A large freezer stores foods not suitable for canning, drying or keeping in a root cellar, but beware of relying solely on it. These canning shelves made just one jar deep allow storage of more than 200 jars.



would come a fairly sophisticated program for emergency heat and light for a six month period.

Also at Level III of preparedness, most people would feel that having one firearm for a family would not be enough protection, and should want to consider specialized firearms, such as a scoped rifle for hunting, and a battle rifle or shotgun as a defensive longarm, along with a personal handgun for each adult.

Farther, at Level III, basic radiation measuring equipment and communications equipment should be seriously considered. At Levels I and II, the emphasis is really on feeding, clothing and keeping the family sheltered. By Level III you can add being informed to the benefits of being prepared. Citizens band radios, scanners that cover police and fire and other community services, small portable AM radios and even ham radio equipment—all should be considered. In addition to all of these you should consider the necessary spare parts and of course a substantial supply of batteries or some way to recharge batteries using solar energy. With the addition of a basic basement fallout shelter, a Level III family should be able to survive most threats.

Level IV

Certainly this is one of the most difficult levels for most people to attain. It's awfully easy to stay in your fairly safe distant suburban home and to get reasonably

organized against most threats.

The problem with Level IV is that it solves most of the problems living near a city has created by having you move far away from the city. Security becomes vastly easier with 300 miles between you and a major city because so much less security is really required. Even your homesite becomes more practical because you do not always have the nagging fear that you'll have to abandon your safe shelter if things should get really bad.

The problem with Level IV is that it requires you to change your employment patterns. Suddenly, some sort of employment that can be done at a distance is needed. It is usually very difficult for a person to move to the country and take away a country person's job. A far better plan is to consider some kind of mail order or computer based business that would allow you to live near a small town but sell your products or service all over the country. This would allow you to move to the country without losing your employment.

Level V

This is best described as a country mini-farm. Here gardening and other food producing efforts are the central theme. You should try to grow almost twice as much as is needed for your own annual food consumption, staying with organic growing and feeding methods as much as you can so that you would be able to continue your

food raising even if you have no outside help, no plentiful gasoline, garden supply stores or fertilizer manufacturers.

By producing more food than you can use each year you'll have a small amount of food that you can sell, either to neighbors and friends, to local residents at a growers' market, or at your own fresh vegetable stand. If nothing else, you can make the food available to needy families through one of the local charities.

A Level V country mini-farm requires lots of storage space, but the environment allows you to have such things as a barn, root cellar, woodshed and other out buildings, which are considered perfectly normal in a rural area.

In planning your food storage, try to provide at least six months of your normal food, those foods you eat every day right now, without relying heavily on frozen food, since freezers are so dependent on abundant electricity. In addition, at Level V you would be building up an additional three to six more months of the basic four food reserves, so that you had close to a one-year supply. The philosophy of having at least a year's supply of food is one which farmers have embraced for centuries. This allows you to eat through the winter and to comfortably get along until the first spring crops start to come in.

In addition to food, a twelve months supply of gasoline to power garden equipment and kerosene for lighting, along with

Continued on page 36

Global Warming:

The Greenhouse Effect

Carbon dioxide plays a key role in the climatology of the earth . . .

By Michael Pietrantonio

The atmosphere of the earth contains a layer of carbon dioxide gas, CO₂. Besides natural carbon dioxide, mankind, through burning of fossil fuels, is continuously adding more CO₂ to the atmosphere. By this process the greenhouse effect is occurring.

IN THE WORST CASE, where climate changes caused grave shortages of food despite U.S. exports, the potential risks to the U.S. would rise. There would be increasingly desperate attempts on the part of the militarily powerful, but nonetheless hungry nations to get more grain in any way they could. Massive migration backed by force could become a very real issue. Nuclear blackmail is not inconceivable . . ."

The paragraph above was taken from a CIA report produced in 1974 in order to furnish U.S. planners with information on the effects of a worldwide change in climate.



The so called "greenhouse effect," first studied by Swedish scientist Svante Arrhenius who coined the term in 1896, has been a subject of intense scientific debate and journalistic doomsaying for almost a century.

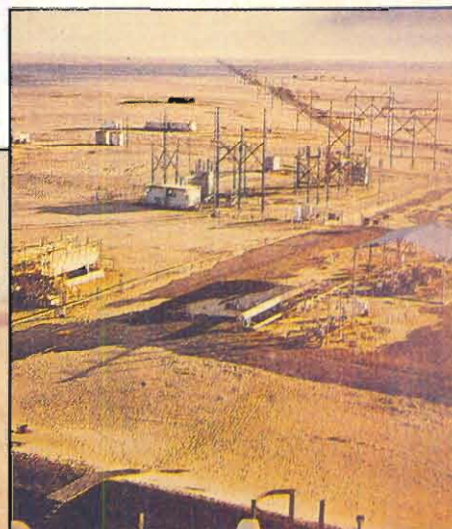
The release recently of two new scientific reports, one by the National Academy of Sciences, the other by the Environmental Protection Administration, has given significant support to the greenhouse effect

theory. These reports indicate that we are indeed in the midst of a climatic change, the effects of which will have far reaching consequences on not only world climate, but also the foreign policy and national security of the U.S.

While the long-term effects of a global warming have often been sensationalized by the media, e.g., polar ice caps melting and coastal cities flooding, little attention has been paid to the relatively short term

RIGHT—The burning of fossil fuels, such as at this Middle East oil field, has raised atmospheric CO₂ levels, setting the stage for global warming.

BELOW—The greenhouse effect may drastically reduce the output of Canadian and American grain belts, with dire consequences for food-dependent countries.



(10 to 50 years) effects of such a climate change. For instance, the CIA report quoted above indicates the possibility of a starving Soviet Union resorting to nuclear intimidation to feed its people. Hunger has more than once been the motivating factor of revolution. Should the rulers of the Soviet Union be faced with the possibility of revolt and the consequent destruction of the communist state, it is not farfetched to assume they would use every available option to assure the survival of their system.

Other possibilities too were considered by the CIA, ranging from the use of large-scale terrorism by smaller starving countries against the "haves," to the possibility of countries using climate modification techniques which would impact adversely on the U.S. and its agricultural output. These possibilities will be discussed later. First though, what is the "greenhouse effect" and how will it impact on global food production?

How It Works—We all know that a greenhouse is used to retain warmth for the benefit of the plants within. The heat energy which warms the interior enters the greenhouse through the glass roof as sunlight. This light is made up primarily of high frequency wavelengths which are unaffected by their passage through the glass of the greenhouse roof. Once these high frequency lightwaves strike the surfaces of the interior of the greenhouse their energy is absorbed by these surfaces. This absorption of energy causes the atoms in the absorbing surfaces to become more active and release heat energy. The heat is in the infrared wavelength of the spectrum and is of a much lower frequency than the entering sunlight. The glass of the greenhouse roof acts as a barrier to this infrared heat energy and traps it inside the greenhouse,

thus raising the temperature.

On a planetary scale the atmosphere of the earth can be thought of as the glass roof of the greenhouse. Acting both as a filter and as a transmission medium for incoming solar energy, the earth's atmosphere protects us by screening out a large portion of cancer causing ultraviolet radiation while at the same time admitting a majority of the solar radiation we see as sunlight.

Once through the atmosphere the sunlight strikes the surface of the earth and, as with the interior of the greenhouse, is absorbed and radiated as heat energy. This heat energy is prevented from leaving the earth's atmosphere in large part by the carbon dioxide (CO₂) gas in the atmosphere. This carbon dioxide acts as does the glass of the greenhouse roof to block the infrared (heat) wavelengths of energy from escaping to space. Without this blocking action and its consequent heat trapping effect the earth would be a cold and lifeless body very much like some of the other planets in the solar system.

We can see by this very basic explanation that carbon dioxide plays a key role in the climatology of the earth. Increase (or decrease) of the CO₂ levels in the atmosphere could in theory upset the balances upon which the earth's climate is maintained.

CO₂ is what we exhale with each breath. CO₂ is also a byproduct of the burning of natural materials such as coal, wood, oil, etc. Geologic processes such as volcanoes also release substantial portions of CO₂ into the atmosphere.

On the other side of the equation, plants, trees and forests consume CO₂ in their biologic processes. The oceans also absorb and retain portions of the available atmospheric CO₂. Other processes both

absorb and give off CO₂, but these generally function on a geologic timescale of millions of years and more. All in all, this bio-geo exchange of CO₂ has resulted in an atmospheric concentration of CO₂ of about one hundredths of one percent. That is a volume of about 2.6 trillion tons of CO₂ in the atmosphere of the earth. Put scientifically, our atmosphere contains 300 parts per million of CO₂ gas.

Mankind has been burning fossil fuels at a furious rate for little more than a hundred years. This burning has released great quantities of CO₂ into the atmosphere. At the same time (especially in the past 50 years), mankind has been obliterating large tracts of forests for development and resources. These two conditions, adding CO₂ to the atmosphere through combustion while removing the natural CO₂ "scrubbers" (the forests), has increased the atmospheric levels of CO₂ to 335 ppm, or a 10 percent increase in atmospheric CO₂ levels in the past 100 years.

Since we know that the CO₂ in the atmosphere is responsible for retaining heat, the increase of CO₂ at such an alarming rate has prompted great scientific concern for an overall increase in global temperatures and the effects such an increase will have on climate, agriculture, and society. This then in brief, is the greenhouse effect.

Global Cooling, Ice Ages—You may have read that we are heading for another ice age, and on the surface this would seem to contradict the greenhouse effect theory. Ice ages come in cycles. There have been eight ice ages in the past 700,000 years. They last roughly 90,000 years each with an interglacial period of 10,000 to 12,000 years between ice ages. We are now emerg-

Continued on page 68

Knife/Axe:

Versatile Machete

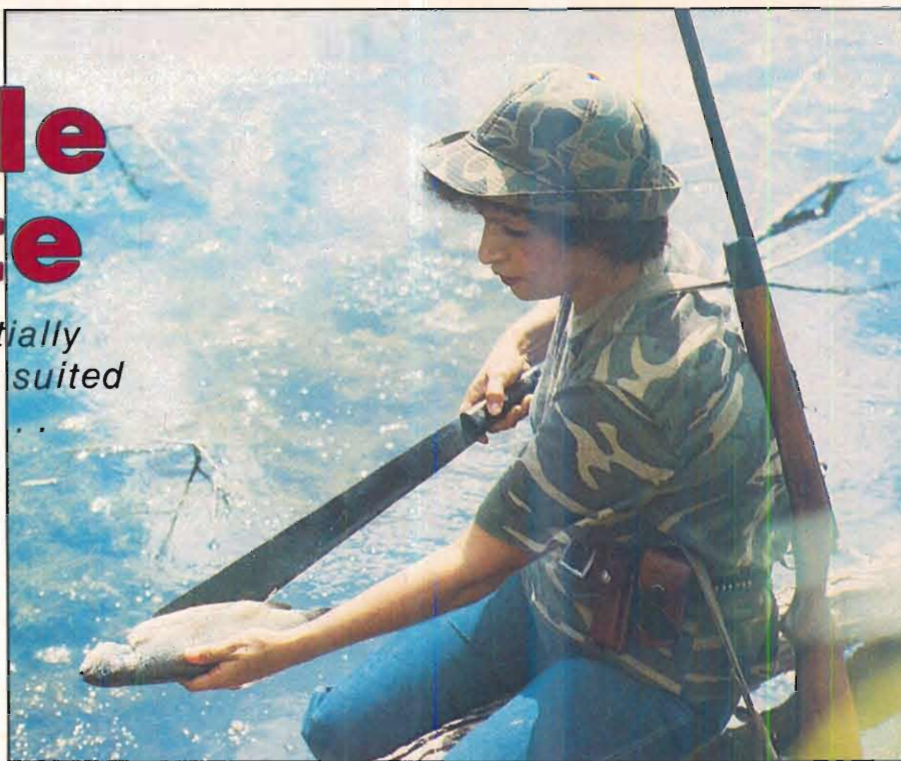
This useful tool is essentially a large, heavy knife best suited to light chopping duties . . .

By Martina Ferguson

ALTHOUGH I CAN no longer recall the name of the book or the exact locale, it was a Bradford Angier type which dealt with outdoor living in the far North—perhaps Maine, or lower Canada. What did stick in my mind was the author's admiring description of the seasoned old woodsman he met and befriended there during the early 1920s:

"Ed was then in his sixties, but moved with the steadiness and grace of a much younger man, on muscled legs which seemed tireless. His normal dress consisted of baggy wool trousers and a checkered flannel shirt covered by a non-descript mackinaw, high laced boots and a floppy felt hat. Thrust into a wide leather belt was his prized Luger pistol, and in his right hand was his ever-present axe. He declared it his most valued possession and he would go nowhere without it. Called from cabin or fireside on any errand, even if the distance was only a few yards, he would pick up the axe and take it with him."

To a person accustomed to the outdoors,



ABOVE—The author cleans a trout with her machete.



LEFT—These are the two most common machete types.

BELOW LEFT—A coat of black spray enamel will protect a machete blade from rust.

BELOW RIGHT—A sharpening file should always be brought along with a machete in the field.



there is nothing at all remarkable in this description. The clothing worn by the venerable outdoorsman was woods-comfortable in that cool northern climate.

The Luger pistol may seem a bit out of place from a present day viewpoint but in that era they enjoyed considerable popularity with woodsmen in both 7.65mm and 9mm caliber.

Even less remarkable was Ed's reluctance to leave his axe behind. The author goes on to relate how he could build virtually anything needed with the axe, from a pine bough bed to a bear trap or lean-to shelter. Highly skilled in its use, there is little doubt that Ed could, in an emergency, use it for more delicate chores such as skinning a rabbit or splitting a fish. Kept sharp and cared for properly, the axe is a nearly perfect woodsman's tool.

What the axe is to the woods wanderer or survivalist of the northern forests, the machete is to the outdoorsmen of the American Southwest. Not as ancient in origin as the axe, this useful tool is essentially a large, heavy knife best suited to light chopping duties. The first men to feel the need for such a tool may have been the Spanish Conquistadores of the 16th century, who found rough going in the jungles of Central and South America. The broadswords they used so effectively for conquest were less than ideal for carving a path through the thick secondary growth of a tropical rain forest.

The usual fighting sword of those brutal times was not only too long, it was too thick and heavy as well. It isn't hard to picture a sweating spaniard grinding down and hammering out a less unwieldy blade from what was formerly a weapon.

In time, the versatility of these blades became so appreciated they became the standard agricultural tool of the region. The machete in various shapes or lengths is indispensable for harvesting sugar cane, bananas and other tropical crops. From past to present, it has also served to gather firewood, construct a thatch hut, and even to hew a dugout canoe from a suitable log. Being a sturdy, single-edged chopping instrument, it can serve as a weapon if need be. I'm told that the campesinos of rural Mexico still settle disputes with the traditional, ubiquitous machete.

Types—Though machete blades are subject to slight regional variations, especially south of the Rio Grande, the most common type seen in the United States is the famous Collins type. These originated in World War 2 for use in the Pacific Theater, and afterward many thousands were sold as surplus. Most were brand new and showed no use, and came

with a well-built plasticized sheath which held the machete safely and securely. Astute buyers snapped these up, and while the machetes are still available, the excellent sheaths are gone.

The average "surplus" sheath in many of today's catalogs are cheaply made, shoddy canvas types of little merit and no value. If you can locate one of the good WW2 jobs, buy it and hang onto it. Failing that, you will have to make your own of leather or other suitable material. Good quality, sometimes even fancy sheaths are available across the border in Mexican leather shops.

Paradoxically, the machete you may encounter wearing a worthless sheath is likely to be a good one. There are no trade secrets in building a machete and several companies have made very serviceable ones. The two I have on hand are of WW2 vintage, stamped "U.S." and "Ontario Knife Co." The shorter one has a straight, bellied blade of mild tool steel measuring 18 inches in length. Blade thickness is a uniform .122 inch and is plainly a steel stamping. Handle material is an unknown but tough black plastic held on by four large rivets. The lower end of the handle features an elongated spur for grip security, and is pierced for a lanyard. This is by far the most common, and perhaps the most useful machete.

Built for heavier duty, the longer blade is as curved as a pirate's cutlass and measures 22 inches in length. Hardly thicker, it is .125-inch thick and curves to an up-swept tip. The greatest width of both blades is about 2¼ inches, but this longer one has noticeably greater "chopping power." I've used it on tree trunks and branches up to six or eight inches in diameter, and it makes short work of them. The lighter blade will do so too, but with more effort. Perhaps on long foraging and backpacking forays the 18-inch machete should be chosen for its lighter weight and greater convenience, but in any semi-permanent camp, the longer blade will prove its worth. Neither will add more than a couple of pounds to a pack, sheath and all.

Sharpening—Because they are constructed of mild steel, machetes will dull easily unless used exclusively on wood. When utilized to dig traps, solar stills, bank fires or dig edible roots, the blade will pick up nicks and scratches.

Naturally, this occurs when the blade strikes the inevitable small stones or gravel. The proper way to sharpen a machete is with a file, just as one sharpens a garden hoe. Using fairly short, sweeping strokes, hone the edge to the desired angle,

then carefully file the other side. Use caution when filing against the edge to avoid a cut finger or thumb. The coarser the bevel, the longer the edge will last, at least under normal circumstances. Some desert survivalists prefer to hone the forward portion of the blade to a coarse edge for digging, then use a steeper bevel toward the handle for a razor sharp cutting edge.

While conceding some merit to this, I find it simpler to keep my entire blade as sharp as possible, retouching it when necessary. Under no circumstances should a machete be taken afield without a sharpening file strapped to the sheath. While it probably could be re-sharpened on a handy rock or boulder, this is a time consuming, tedious chore and may use up more energy than you care to expend.

What will the machete do that an axe won't? Probably nothing of any importance, but it is both lighter and more convenient to carry. In the arid Southwest, heavy timber is lacking, and the axe may be something like overkill for the light vegetation found there. The greatest advantage the axe has is that it may be used two-handed, while the machete is strictly a one-hand proposition. This makes prolonged chopping tasks tiring, but unless you are building a log cabin it doesn't matter. The machete does very well for firewood and light shelter construction. Percentage wise, it may possess as much as 80 percent of the usefulness an axe does.

Cost—In the area of initial cost, the machete holds the advantage, and can be purchased for a fraction of the price a quality axe demands. Inherently cheap, the machete is almost expendable. Even so, use caution when buying one, as inferior blades undoubtedly exist. Check for handle fit and straightness, and be sure to flex the blade. Although made of mild steel, a good machete is tempered, and consequently very "springy."

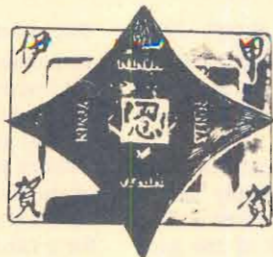
Don't be discouraged by a rough finish or an excess of tool marks. This is typical of the breed, and so is a crude parkerizing to prevent rust. Blade wear and humidity will contribute to rusting, and it may be a good idea to spray paint the entire blade with black enamel. This finish wears well around salt water and can be renewed in a few minutes.

A sharp machete can also skin a rabbit or clean a fish, dig a hole for any purpose, or perform any number of impromptu but necessary chores. Swung resolutely and skillfully, it may even serve as a secondary line of defense, and can be a formidable weapon. Like the northern woodsman's axe, it is the mark of the desert survival expert. ●

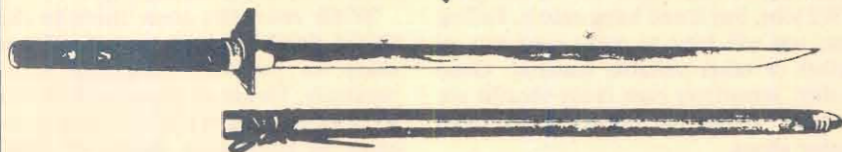


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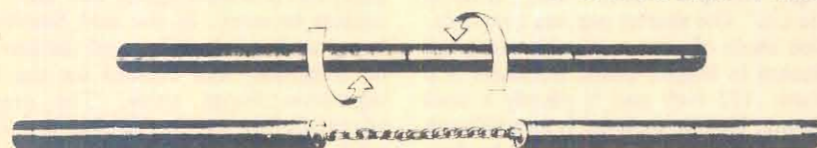


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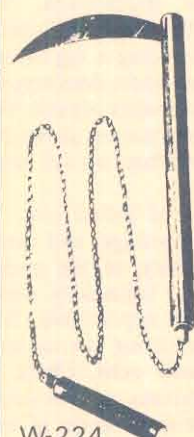


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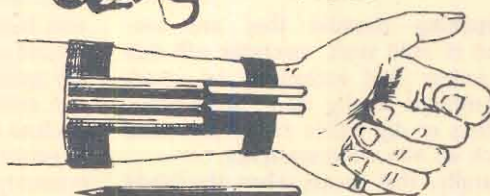
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SELF SUFFICIENCY

Continued from page 25

propane for the kitchen stove and hot water production, need to be worked into the plan. The heat for the house itself should also be independent from the normal utility companies, which suggests a solar-heated house with a woodstove backup. Many country homes today are being built as earth-sheltered solar homes so that they only minimally use fuel.

It would also probably be just as well if your retreat were away from the view of the public, allowing you to continue to function on your homestead without attracting a lot of attention from passersby.

Level VI

Really, this is Level V after two or three years have gone by. Level VI requires more than just money; it requires a lot of time and energy. Level VI is really better described as a full country farm with complete backups for long term operation without electricity or gasoline.

This level requires redundancy such as spare parts for critical pieces of equipment—including such things as a spare parts kit for the rototiller, with 20 or 30 gallons of gasoline to provide four or five years of service, plus a full set of handtools of every kind so that the garden could be worked without any power tools. In addition, Level VI implies complete alarm systems both for the property and the living areas to give you advance notice of intrusion of any kind; also more emphasis on firearms, spare parts and your knowledge of repair; along with more ammunition reloading equipment and components so that you can reload your own to provide several years of hunting and defense ammunition.

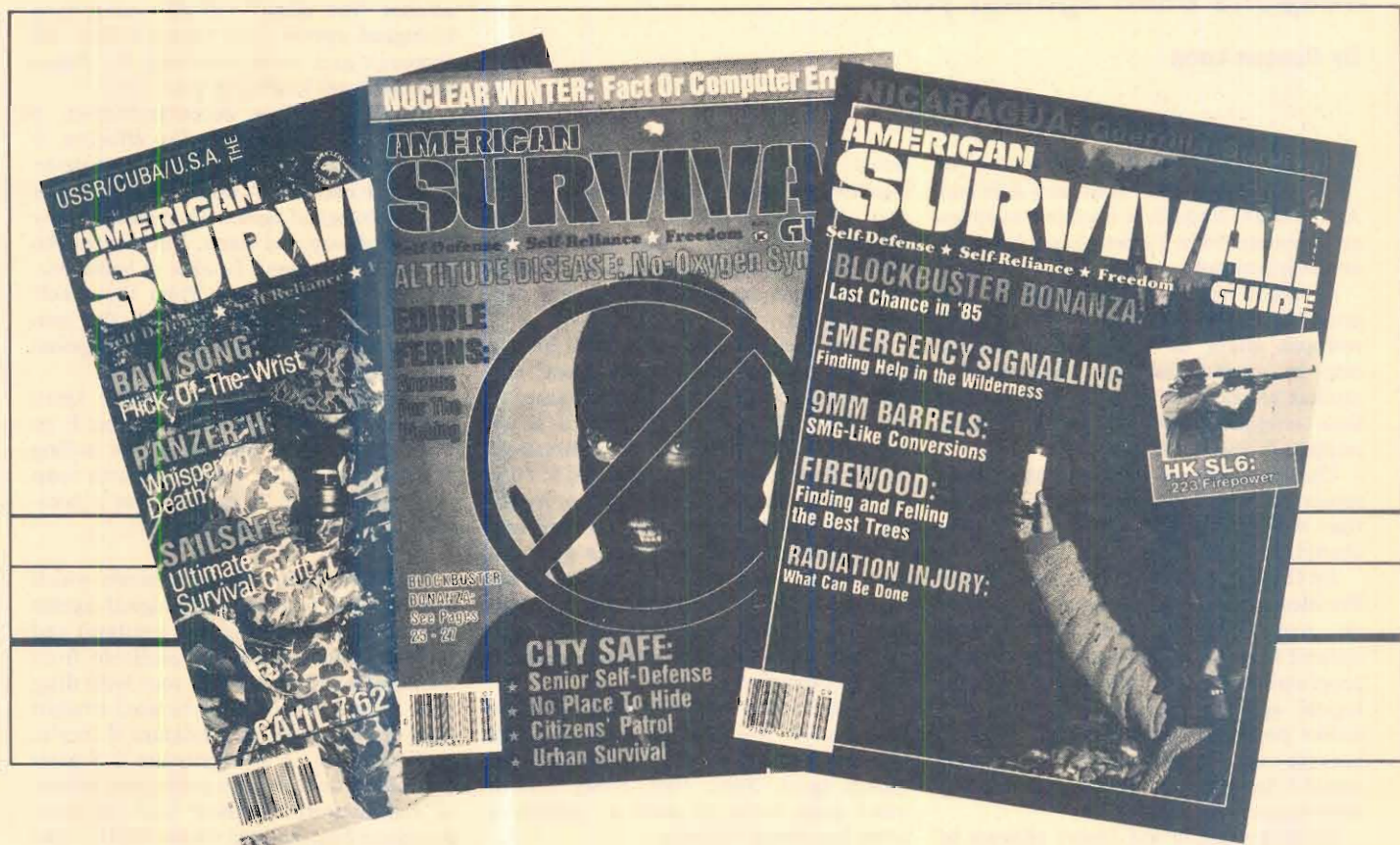
A full country farm also suggests much larger quantities of stored food, with most people considering 365 days of your family's regular diet plus another 365 days of the basic four to be a normal kind of storage program. This would allow for an almost complete year of crop failure, something that could probably only happen in an all-out nuclear war. Included in the storage program should be long term storage of seeds, including a selection of seeds which would grow reasonably well after nuclear war.

Also your private water supply should be converted from commercially available electricity to something which would always be available to you. Many country homes use windmills with elevated water tanks to provide pressurized water without electricity. Some are forced to depend on gasoline, diesel generators or solar power for electricity to run the water pump. In any case a private supply of water without commercially available electricity is a necessity.

The difference between Level V and Level VI also probably includes the phil-

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Decontamination

With a little know-how, you can survive having these weapons used against you . . .

By Duncan Long

WE ALL KNOW about reports of "yellow rain" in Southeast Asia and Afghanistan. Reports of chemical weapons attacks come from Yemen, Laos, Vietnam and Afghanistan.

If recent history is any indicator, the possibility of a chemical/biological weapons attack on a civilian population may be greater than the chances of a nuclear attack. The Soviet Union has had little compunction about using, or allowing puppets to use, such weapons.

Chemical weapons have been more commonly used by the Soviets and their allies than biological weapons, but that may be changing.

An October 1984 report produced by the President's General Advisory Committee on Arms Control and Disarmament showed that the USSR has stepped up its programs which are developing new biological agents. Many believe these are unlike previous "germ warfare" weapons because the new "germs" are being created by modern genetic engineering techniques.

Though some of the report appears to have been censored by the State Department, perhaps in an effort to keep things smooth at the next arms control meeting, insiders maintain that the USSR has made startling advances in biological warfare.

And, lest you look at the problem as being that of Europe and Asia, it might be a good idea to reflect on the fact that many experts believe Cuba has stockpiled biological weapons.

With just a little know-how, you can survive having these weapons deployed against you.

Biological Decontamination—The first step in avoiding contamination by biological agents is to protect your body. Common good health habits help. There is a lot you can do to protect yourself in other ways too. A number of books and manuals are available on the subject of biological/chemical decontamination. Study these so you can learn how to detect and avoid this threat. Two such books are listed at the end of this article.

Unlike the military, you may have stores which cannot be abandoned. You have no supply line. What happens if an enemy

douses your area and your refuge with a liquid containing biological agents? Abandon all your supplies? Not if you can decontaminate your refuge area. If you know decontamination procedures you will improve your survival chances to a very great extent.

Most known biological agents have a delay factor: symptoms develop only several hours to days after your exposure to the agent. That means you have to be on the lookout for biological contamination; by the time symptoms develop it's too late to protect yourself. Using caution, avoiding contaminated areas when possible, and decontamination of any area or gear you must be in or near are the keys to surviving biological attack. Whenever you feel that you might have been exposed to a biological agent, you should undergo decontamination procedures.

Another tricky part of biological warfare is the use of "vectors." Vectors are plants or animals which are used to spread a biological agent. Fleas, flies, mosquitoes or other pests could be used as vectors to carry dangerous bacteria.

Good hygiene will cut down on a lot of your exposure here. Window and door screens, insect traps, insect poisons and insect repellents would all be important as well. Since some of these vectors may be "piggy backed" on other vectors, rodents or unusual animals or birds in your area should also be suspect.

Most biological agents are living organisms which can survive only for a very short time outdoors. A dry, clean, sunlit environment is death for most microorganisms used for biological weapons. If the humidity is low in the area, most non-persistent biological agents would be killed within 24 hours when exposed to the sun and wind. Though spores might remain in the area, mother nature would pretty much decontaminate it after several days of sun and wind exposure at low humidity.

People and small gear can be decontaminated in the same way they are when exposed to contagious diseases. Disinfectants and hot water with lots of soap are the order of the day. Special care should be taken to clean out and treat any cut or sore exposed to biological agents. A 70 percent ethyl alcohol or 80 percent isopropyl

alcohol "rub down" will also clean most biological agents from person's skin. Be thorough and avoid breathing the fumes and don't get alcohol in your eyes.

For large-surface decontamination, a detergent in hot water is also effective, if the detergent is not too harsh for whatever it is to be used on. A word of caution: Not all the biological agents are neutralized by the use of soap and water. But they will be rinsed off and won't be able to harm you, *provided* you stay away from the runoff water which you used to wash the contaminated items. That should be disposed of in a safe place.

Heat can be used to sterilize small objects. Temperatures of 355 degrees F. or warmer for two or three hours, or boiling something in water, preferably with soap or detergent, for 20 minutes—at a complete boil—will decontaminate it.

Chemical Aids—Two chemicals which can be used to combat biological agents are formalin (formaldehyde solution) and methyl alcohol. Both are available from chemical supply houses or your local drug store. The two liquids can be used straight from the bottle or in a mixture if they're both available. A good mixture is 5 parts formaldehyde to 3 parts methanol. Either, or the mixture of these will kill non-persistent bacteria and viruses within eight hours indoors. But you will need to allow some additional time for an enclosed area to air out—the fumes are dangerous. Use a spray bottle to apply the mixture at the rate of 4/5 quart per 100 cubic feet of space to be decontaminated.

Used by itself, a formalin solution of 36-40 percent solution gas to aqueous inert ingredients is the best choice. It should not be diluted and would be used indoors at a rate of 1 quart per 1,000 cubic feet of space to be decontaminated. An indoor area should be kept closed up for 16 hours following a spraying and then allowed to air out for three days before being occupied. Formalin leaves a white residue on some objects following decontamination. The residue is harmless and can be removed with hot water.

Two-Pronged Attack—What if you are attacked with both chemical and biological weapons, or what if you aren't sure whether the sticky goop or mist falling around your retreat calls for chemical or biological decontamination?

Two chemicals used for chemical decontamination, sodium hydroxide (caustic



A number of household, over-the-counter products contain the chemicals that work well for chemical weapon decontamination.



Biological agent decontamination can be carried out with a number of common commercial products which were designed for cleaning and disinfectant jobs around the house.



Household products containing sodium hydroxide (caustic soda or lye) or sodium hypochlorite (household bleach) are practical multi-purpose decontaminants since they neutralize chemical or biological agents.



Part of fighting off the effects of a biological attack is dealing with vectors. Insecticides, repellents, traps, and proper hygiene will form the first line of your defense.

soda or lye) and sodium hypochlorite (household bleach), also work for biological decontamination.

Two good solutions which will work as multipurpose decontamination chemicals are: 5 pounds of sodium hydroxide mixed in 12 gallons of water and ½ cup of bleach per gallon of water. For super-duper cleaning of small objects, the bleach can be used straight or detergent can be added to either solution to help it lift off oily contamination. Remember, too, that sodium hydroxide reacts with aluminum and some other metals and that it should be mixed slowly into the water to avoid a violent chemical reaction.

Food/Water Contamination—If your supplies have been exposed to biological contamination, the contents of sealed cans, jars and some plastic wraps which are airtight should be safe to use if the container was disinfected *before* you opened it. The outside of such containers should be cleaned by at least a 5-minute immersion in sodium hypochlorite or by soaking in boiling water for at least 20 minutes.

Food contaminated by biological agents may sometimes be salvaged; but you must be sure that the contamination involves

only biological agents and not chemical ones. If you have doubts, discard the food. Biologically contaminated food can be decontaminated in the following ways: By boiling the food in water for 20 minutes; by cooking it in a pressure cooker at 15 pounds, 250 degrees F. for 20 minutes; or by baking it at 400 degrees F. for 40 minutes or for 325 degrees F. for two hours.

Although it is nearly impossible to use water contaminated by chemical agents, the same is not true of biological contamination. Water can be decontaminated by boiling it at a complete boil for 20 minutes. Water purification tablets or other chemicals used for killing bacteria and viruses can be used if the normal numbers of tablets are doubled. Be sure to allow the chemicals at least half an hour to kill the biological agents before the water is used.

Anthrax—There are persistent microorganisms which might be used as biological agents that could contaminate an area for decades. These are anthrax. The USSR is thought to have stockpiles of it. The only solution to contamination by this type of weapon is to abandon the area and never go into it.

The key to surviving persistent biological weapons attacks is avoidance. Give some thought to what you're doing, what areas would be attacked by persistent agents, and keep a low profile if an enemy is in your area. Most persistent biological weapons would be used only when areas are to be totally ruined for later use, a good reason *not* to be in an area of strategic value.

Chemical Decontamination—Thousands of people have been killed by chemical weapons in the past few decades. Hopefully, you have a gas mask, protective suit, gloves, boots and know-how to use them. If you do not have these, *get them*. But having this gear is a little like having a flashlight without batteries if you don't know how to decontaminate areas made dangerous by chemical or biological weapons.

Decontamination of chemical or biological weapons has two parts. One is neutralizing the chemicals or killing the organisms that make the agent dangerous. The second is causing the substance that carries the agent to quit adhering to the area so you can wash it off and then dispose of the contaminated water safely.

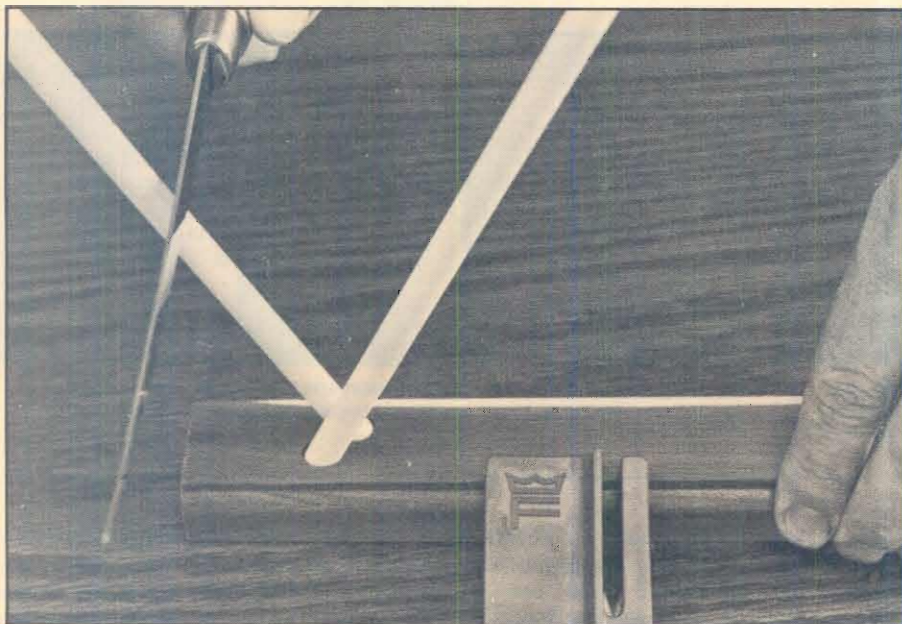
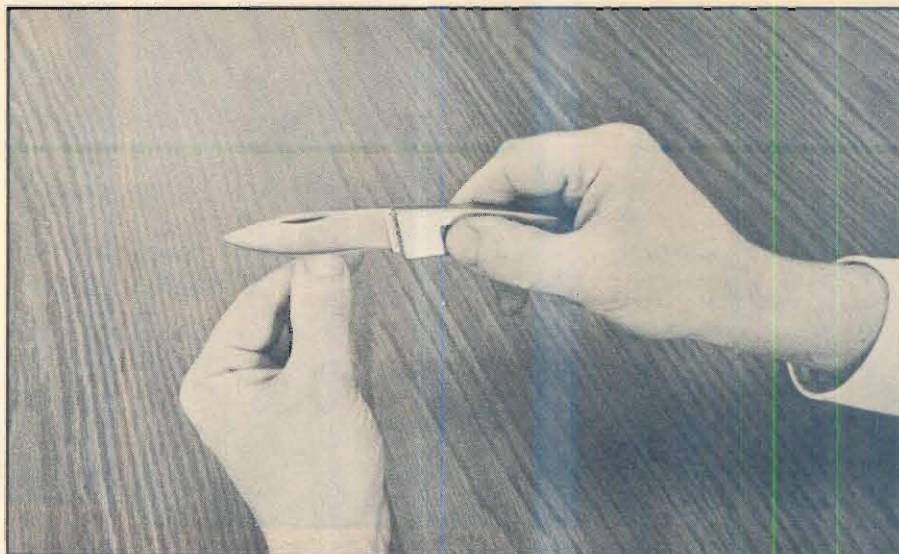
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Sticks, Stones:

Cutting Edge

Try the thumbnail test . . .

By Helen Mason



Ceramic sticks will shave off small amounts of metal without distorting the blade.

Hold a knife blade at a 45 degree angle to your thumbnail. Try to drag the blade across the nail. A dull knife will slip back and forth; a sharp one will grab a piece of nail each time you try to move it.

steeple shape of the cutting edge to fit their own contours.

A knife that is too dull for a pocket sharpener, but not blunt enough for a proper stoning can be restored with a full sized pair of ceramic sticks. Just a few strokes will shave off small amounts of metal without distorting the blade, thus restoring the knife's cutting edge.

The sticks themselves are an excellent example of what can be done when people learn to use what's readily available. They were originally produced as electrical insulators. By trial and error, electricians found they made great knife sharpeners. That's why, when one utility company switched to another material, a far sighted entrepreneur bought up the scrap insulators and sold them, at a considerable profit, as knife sharpeners.

Today, ceramic sticks are produced specifically for blade finishing. The best come with a stand that holds the sticks at a slight angle. If you hold your knife at right angles to the base, the blade will be at 23 degrees, the optimum angle for producing a durable edge.

Cut firmly downward as you draw the blade evenly across the sticks (see photograph on this page).

Stones—Both the pocket and regular sized ceramic sticks are fine for the little jobs. A really dull knife needs a stone. Today, there are a variety of man-made and natural stones ranging from the soft coarse silicon carbide to the hard but super fine Black Arkansas. Like sandpaper, the coarser stones make quick rough cuts into knife metal, while the hard finer ones do less cutting and more polishing.

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WHETHER IT'S a fighting knife, a survival blade, or a filleting tool, without a proper cutting edge, your knife isn't worth the energy it takes to carry it. Maintaining the ideal degree of sharpness is an essential skill.

First, check the condition of each of your knives. If you're like most of us, the one you carry all the time will have a flattened section at the end caused by cutting against a plate; the others will be in various stages of dullness.

Most people check their knives by trying to cut an ordinary piece of paper. If they can easily pare a couple of slices off the edge, they figure the knife is sharp; if the paper only tears, the blade needs some work. Although this works, according to Roger Cannon, Canadian vice president of Normark, Ltd., the thumb nail test is a better assessment tool. With the knife held at a 45 degree angle to your thumb, try to drag the blade across the nail. A dull knife

will slip back and forth without sticking. A sharp one will grab a piece of nail each time you try to move it.

Alternatively, you can examine the edge of the blade. A very sharp blade gradually forms a steeple so narrow the end seems to disappear. As the edge begins to dull, the top will fold over and/or break off, revealing wider sections of blade that catch the light. This is particularly evident on the flattened tip of a pocket knife that has cut meat placed on a camping plate (all materials except plastic do a great dulling job). Such a knife will need far more work than one that has been used only for fish filleting.

Sticks—Knives that have barely lost their edge can be fine tuned with a pocket sized pair of ceramic sticks. These true up the edges of the blade, but don't remove any bad nicks or flat spots. After continuous use, they microscopically distort the

Battle Rifle:

The SAR-48

This isn't a cheap take-off on the original FN FAL, but rather a carbon copy down to the last detail . . .

By Joe Zambone

THE BELGIAN-MADE FN FAL, is reliable powerhouse in 7.62mm NATO (.308 Winchester) caliber, is one of the world's most respected battle rifles. Dozens of foreign military forces issue this rifle to their troops, and current doctrine decides whether or not the weapon sports full-auto or semi-auto capabilities. The fierce Gurkha soldiers, for example, carry semi-auto FNs into battle, claiming that hard-hitting full-auto rifles result in wasted shots and high ammo consumption.

To solve the terminology problem, "FN FAL" stands for *Fabrique Nationale* (the manufacturer), *Fusil Automatique Legere* (Light Automatic Rifle, which is why many people refer to such rifles as LARs).

The problem with a genuine FN is the price, upwards of \$2,000 by the time you add on accessory trinkets such as a bayonet and sling. That puts it out of the reach of most people who aren't actively engaged in slaying enemy hordes, but leaves the door open for competition.

Enter Springfield Armory of Geneseo, Illinois, with their SAR-48, a bargain-basement FN copy which retails for an amazingly low \$899—with two magazines, bayonet and scabbard, sling, carrying handle, cleaning kit, magazine loader and blank firing adapter thrown in. Their poor man's FN isn't a cheap take-off on the original, but rather a carbon copy down to every last detail.

The cost is kept down by having the parts manufactured in Brazil, with final fitting and assembly done at Springfield's Illinois factory. For purists who insist on American-made products, consider that buying a pedigreed FN-FAL does less for the balance of trade than buying an SAR-48, which involves American craftsmen in assembly.

Operating Principles—The SAR-48 is a semi-auto, fixed-barrel, gas-operated rifle. After firing, while a bullet is still approaching the muzzle, a tiny portion of the propellant gases enters the gas plug above the barrel and forces the operating rod backwards to unlock the bolt and cycle the action. The spent cartridge case is ejected during the bolt's rearward travel,

the operating rod and main recoil springs are compressed, and the hammer is cocked for the next shot. As the bolt travels forward it strips a fresh cartridge from the 20-round magazine and chambers it.

The gas plug has two settings, spaced at 180 degrees. The "A" setting is for firing standard ammunition; rotating the plug brings up the "G" setting, which funnels maximum recoil gases to the operating rod for grenade launching, or for reliable cycling when firing low-power blanks.

Basically, then, the SAR-48 operates like a semi-auto M1A or M14, a Mini-14 or a Ruger .44 Magnum carbine. Gas operation, plain and simple. Fully automatic versions with select-fire are available, for police agencies, military forces or those with a BATF Class III license and an endless supply of costly ammunition.

When Springfield Armory drew up the SAR-48 specs, they specified that all parts would not only be new, but forged for the ultimate in brick-outhouse construction. Barrels are chrome-lined for long life and corrosion resistance, and metal parts have a sturdy military-type Parkerized finish. Our test firing abuse leads us to believe the finish should last forever.

The SAR's barrel is 19.5 inches long, chamber included, which gives an effective rifling length of about 17.5 inches. An effective flash hider (standard issue) with four rows of three holes angling muzzle blast away from the shooter, extends barrel length to about 22 inches.

NOTE: We shot video film of the SAR-48 during firing, and played it back in stop-frame mode to check muzzle flash which might be quicker than the eye. There is NO muzzle flash except with Accelerator ammo, and even that flash is almost imperceptible.

A nice accessory is the blank-firing adapter included with every SAR-48. It screws into the flash hider, and sports a knurled knob with a tiny hole which restricts gases and creates enough back-

pressure to cycle the action. The knob is red, to preclude accidents caused by shooting live ammo with the adapter in place.

Retracting the SAR-48's left-side cocking handle draws the bolt back and cocks the massive internal hammer. The bolt is locked back by pressing upward on the bolt-catch knob with no magazine inserted; it stays to the rear when a magazine is inserted, or after the last round is fired from a magazine. Once the bolt is drawn back and locked, the cocking handle is moved forward to lock in place via a positive ball detent.

We found the cocking handle easy to grasp in a hurry, even when wearing gloves. The glass-smooth action is easy to operate, and suitable for small folks or women. The bolt is released either by pulling back on the cocking handle or by moving the bolt handle downward to unlock the bolt.

Most people don't think about it, but the cocking handle's left-side mounting permits quicker manual cycling of the rifle because the firing hand and trigger finger don't have to be moved. In prone position, a faulty round can be removed, or the weapon cleared, without disturbing the sight picture.

Nifty Feature—Most military gas-operated rifles are designed around standard issue ammunition. But an M14 or M1A, for example, may fail to cycle with lightweight varmint rounds. On the other hand, firing an over-heavy slug in these same rifles can bend the operating rod, because the heavy bullet allows excess pressure to act on the gas piston or operating rod.

Happily, the SAR-48 has an adjustable gas regulator, which allows "tuning" the amount of gas metered to the operating rod (there is no separate gas piston). Turned fully to the right, the regulator bleeds off most of the gases which would act on the rod, the ideal setting for shoot-



The SAR-48

ing overweight slugs. A full-left turn allows the maximum amount of gases to contact the rod, useful when firing blanks, varmint loads or grenades.

During testing, we found we could tune the amount of gas pressure to precisely accommodate *any* round. By dialing in extra pressure, for example, we were able to shoot hyper-velocity Remington "Accelerator" ammunition, which uses a varmint-type .22 caliber sabot slug weighing 55 grains.

NOTE: There's probably no better round than the Accelerator if the rifle is used for home defense. At a muzzle velocity of 3500+ feet per second (fps), the bullet would be deadly against two-legged adversaries to 300 yards, and penetrate automobiles or 3/8-inch steel plate at close range. But it will also self-destruct soon after hitting pavement or a house wall. Ricochets with standard 7.62mm ammo carry forever, but a bounced Accelerator slug is so mangled it dissipates energy quickly.

Tuning in the opposite direction allows firing bear-blasters in the 200-grain category (which might ruin an M14 after a box of rounds). This feature makes it possible to use almost any handloaded powder/bullet combination in a pinch, whereas a less-than-ideal load might not work worth a damn in a standard gas-operated rifle.

To sum up tuneable gas recoil settings, we feel this feature by itself is worth at least the rifle's price. The added ability to fire ultra-fast, ultra-light varmint ammo

like Remington Accelerators, which cannot be done in normal gas-operated weapons, makes an FN-type rifle truly versatile.

The SAR-48's overall length is 44 1/2 inches, but look for folding stocks within a year, says the factory; in the meantime, skeleton folding stocks which fit the genuine FN FAL will also fit the SAR. These are terribly expensive, as will be Springfield's version, and none of them will permit firing with the stock folded, a la John Wayne assault tactics.

Without magazine, the rifle tips the scales at 9.4 pounds. This isn't a feather-weight, but that added heft reduces recoil and makes a long firing session more enjoyable.

The standard pistol-grip stock is ugly black composition plastic, which should last a week longer than Armageddon. A rubber butt plate offers cushy relief to those who spend all day at the range. The same plastic is used in the ventilated hand-guard, made of two pieces which split vertically and come apart with a single screw.

A handy cleaning kit is hidden in the stock's pistol grip; it pulls out to reveal weapon oil and applicator, a bore brush, and nylon cord which serves as the cleaning rod.

The SAR-48 has a carrying handle which attaches to part of the gas mechanism. Many "assault rifles" offer such handles optional at heavy prices.

A 10-inch bayonet is supplied with the

SAR-48 at no extra cost. It mounts to the flash hider, with the blade sticking out under the muzzle.

A sturdy bipod, which mounts on the barrel just behind the sling's swivel-ring, adds stability to the SAR-48 in prone position. We found it to be a welcome accessory, despite horrendous expense (\$102.70), which makes the aftermarket Harris bipod a much better deal). A problem was that our bipod didn't lock into extended position, and a shooter who pushed the rifle forward in prone position accidentally collapsed it.

Sights—The front post sight nestles into a protective mount, and is used to establish the initial elevation zero. After zero is established, the rear peep sight—which slides on a ramp—is used to dial in ranges from 200 to 600 yards. Rear sight windage adjustment is easy; simply loosen two screws until the rifle is on target, then tighten them. We found the SAR-48's sights to be foolproof, and easy to acquire in fast-shooting scenarios or in low-light conditions.

Although only iron sights are currently available. Springfield Armory will offer a scope mount soon (\$96). Standard rings will cost \$10.50; "see-through" rings will cost \$16.30. Decked out with a good combat or hunting scope, the SAR-48 would make a dynamite sniper/game rifle.

Standard magazines hold 20 rounds; 5- and 10-round versions are available. The magazine release catch, just in front of the



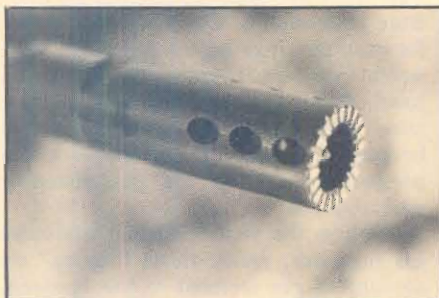
A handy cleaning kit in the pistol grip holds oil, bore brush and flexible cleaning rod.



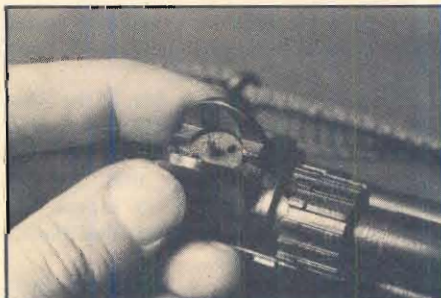
Pressing the lever on the left side of the receiver breaks the SAR-48 open for cleaning or repairs.



The gas plug has settings for regular fire or grenade/blank shooting.



The flash suppressor is very effective.



Initial elevation zero is set with the post front sight. Note the sturdy protective wings. Once the rifle is zeroed for elevation with the front sight, the sliding rear sight is used to dial in ranges from 200 to 600 meters.



trigger guard, is easy to operate with the firing hand's forefinger. Pressing the release allows spring pressure to eject the magazine, leaving the left hand free to grasp a fresh magazine.

The ball-detent safety lever is just above the pistol grip, and can be actuated with the shooting hand's thumb when ready to fire. It's up to "S" for SAFE, and down to a red "F" for FIRE. We weren't able to make the SAR fire with its safety engaged.

As mentioned, barrels are chrome-lined and should last nearly forever. They have 4-groove right-hand rifling, with a 1-in-12 inch twist rate. Many .308 sporting rifles have 1-in-10 twists to stabilize heavy hunting slugs, but this doesn't produce the best accuracy in varmint-weight bullets. We feel the SAR's twist rate is an ideal all-around compromise.

A good military weapon must easily break down in seconds so a soldier can clear jams, replace broken parts or clean

gunk from crevices. The venerable FN-LAR design is idiot-proof, and fills the bill admirably.

The left-side locking lever (behind the safety lever) is moved upward to break the SAR-48 down like a pop-open shotgun, which allows the bolt carrier and firing pin assembly to slide out rearward. The bolt lifts up and out of the carrier in a flash, and pushing out a pin frees the firing pin and spring for maintenance.

Access to the gas recoil mechanism is by depressing the spring-loaded pin on the gas plug and twisting the plug one-quarter turn to the left. The plug's removal allows access to the operating rod and spring.

The field manual supplied with each rifle details these procedures; field breakdown is so simple you'll wonder if that's all there is to it. Like some computers, this weapon is "user friendly," mainly because the FN FAL is aimed at (no pun intended)

Continued on page 38

SPRINGFIELD ARMORY SAR-48 RIFLE: TECH SPECS

Caliber	7.62mm NATO (.308 Winchester)
Action	Gas-operated, adjustable recoil pressure
Types of Fire	Semi-automatic (select-fire available)
Lengths:	
Barrel, Inches	19.5
Overall, Inches	44½
Weight, Pounds, Empty	9.4
Magazine Capacity & Type	20 rounds, staggered (5- and 10-round magazines available)
Sights:	
Front	shielded elevation-adjustable post
Rear	peep, fully-adjustable with combat settings
Price, Suggested Retail	\$899, with accessories
Manufacturer (Importer)	Springfield Armory, Inc., Dept. ASG, 420 W. Main St., Geneseo, IL 61254; (309) 944-5631

SAR-48 BALLISTIC PERFORMANCE CHART

Velocity data taken with Oehler Model 33 Chronotach using Sky Screen III detectors; test firing at ten feet from muzzle to first screen; 45 degrees F ambient temperature; elevation 1,202 feet above sea level.

CARTRIDGE	BULLET WT.	VELOCITY	ENERGY, ft-lbs	VARIATION
Rem. Accelerator	55 gn Spire	3531 fps	1522 fpe	38 fps
Winchester	125 gn PSP	3031 fps	2549 fpe	26 fps
Winchester	150 gn Silvertip	2764 fps	2544 fpe	23 fps
Winchester	180 gn Silvertip	2556 fps	2610 fpe	34 fps
Federal	150 gn JSP	2743 fps	2506 fpe	39 fps
NATO MG ammo	147 gn FMJ	2842 fps	2637 fpe	51 fps
Military Match	173 gn FMJ	2531 fps	2659 fpe	28 fps

NOTE: "Variation" figures are the spread in feet per second between slowest and fastest rounds in a shot string, and are an indication of potential accuracy. Generally, variations of 50 fps or lower indicate ammo/gun combos suitable for accurate hunting or defensive shooting at rational ranges. For extreme accuracy, variation figures should be 40 fps or lower.

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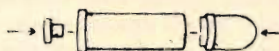
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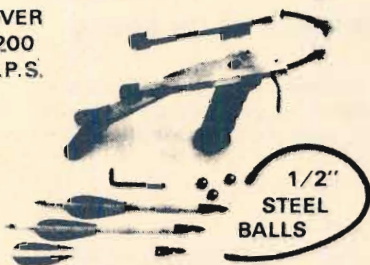
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The SAR-48

Continued from page 37

military users who are notorious for screwing up anything with more than one moving part.

Test Firing—No matter what ammo the test team fed its SAR-48, it functioned flawlessly. As the accompanying velocity chart shows, we tried different weights and brands of ammunition to check overall functioning. It passed with flying colors.

In the event of a breakdown (which, given the FN's track record, is about as likely as hair growing on a billiard ball), Springfield Armory has long had a good reputation for backing up what they sell. If it breaks they will fix it, with the simple limitation that the fault lies with the weapon, and not because you dropped it out of a Huey gunship over a banana republic.

Due to heavy fog and magazine deadlines, we weren't able to fire long-range accuracy tests. However, one good indication of a weapon's potential accuracy is the velocity spread between slowest and fastest shots in a string of chronographed rounds.

Our Model 33 Oehler Chronotach with Skyscreen III detectors showed that factory ammunition had an average spread of about 34 fps per shot string. Past experience tells us that's better than needed to fend off human attacks, and good enough for any hunting scenario. It's safe to say that a good marksman can knock down an adversary or game animal at 300 yards with every trigger squeeze. In the hands of military snipers, kills have been made with the FN FAL at ranges out to 800 yards or more.

The primary role of a fast-shooting, hard-hitting rifle like the SAR-48 is, of course, military defense or assault. In short, the thing is designed to kill or wound humans efficiently. But there's another world of shooting which the SAR-48 meshes with. How about varmint shooting, using a high-power scope and light bullets at ranges out to 200 yards or so? Or maybe hunting for game animals up to elk-sized, no trick when the right ammo is used and effective ranges are kept in mind. Don't forget plain ol' plinking—waltzing pop cans all over the place for the sheer fun of it (remember a safe backdrop with such high-spirited weapons!).

It's worth repeating that a mint-new Springfield Armory SAR-48 will set you back about half what a pedigreed FN FAL sells for, or \$899 with the extras already mentioned. Backed by Springfield's generous warranty (and concern for customers), it's hard to see how anyone could go wrong buying one of their SAR-48/FN FAL clones.

For more information, contact Springfield Armory, Inc., Dept. ASG, 420 W. Main St., Geneseo, IL 61254, or phone (309) 944-5631. ●

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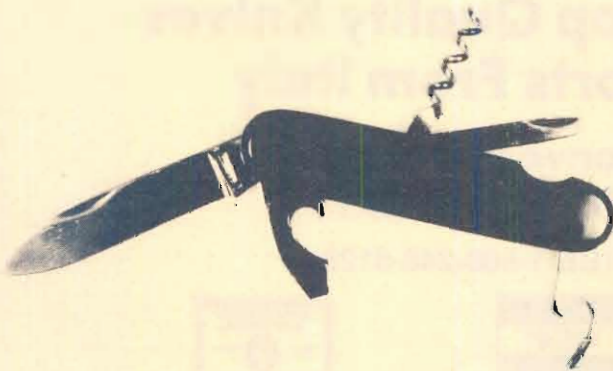


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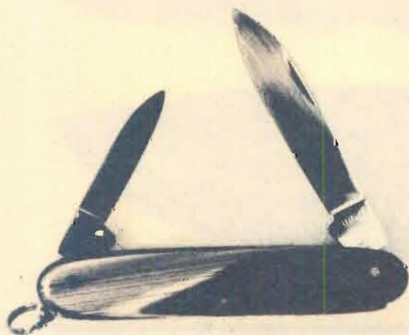


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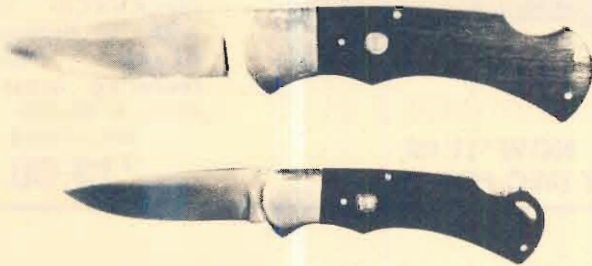


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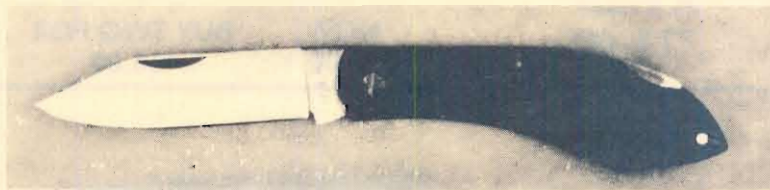
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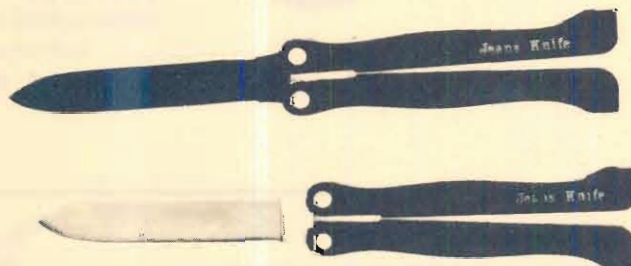


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True Story:

Cascade Blizzard



'The search for a lone bowhunter has been called off . . .'

By David M. Brahosky

HYPOTHERMIA; hy-po-ther-mia, "the gradual decline of body functions due to core heat loss." Funny word, sounds like a phobia, fear of needles or something. In earlier times it was called "exposure." Before that, freezing to death.

These and other morbid thoughts chased each other around in my head as I snuggled deeper into my sleeping bag. "... And now this late breaking news story. The search for a lone bowhunter has been called off due to the increasing intensity of the blizzard on the northern slopes of Mount Baker in the Mazama Dome area. U.S. Navy Search and Rescue helicopters from Whidbey Island Naval Air Station have turned back, forced down by the high winds and gathering darkness."

That did it. I braved the frigid air inside my tent long enough to start another pot of water in my mountain stove and gulp down

a couple handfuls of trail mix. It was also time to replace my burned out stub of a plumber's candle. It didn't put out much heat, my sleeping bag still squeaked with water when I rolled over. I'd tried to wring it out before scrambling into my tent, but the wind numbed my hands as soon as I removed my wool gloves. Frostbite was my major fear, as was losing the mobility of my hands and fingers.

As I sipped my third cup of International coffee of the night, with a generous dollop of butter in it, I reflected on the events that had brought me to this high, desolate, but incredibly beautiful place.

In May of 1982, the notice went out from the Department of Fish and Game in Olympia, Washington. Bowhunters who wish to enter the drawing for Rocky Mountain Goat tags, enclose \$35.00 with your application and send it to . . .

Six weeks later I was notified that I was

one of the lucky ones who had drawn a tag in the Mazama Dome area. Mazama Dome looks down on the Mt. Baker Ski Lodge. Mountain Goats look down on Mazama Dome far below them.

For most of the summer I'd climbed the trails and ridges around the area I would hunt in weeks to come. I'd sit for hours on the great hogback ridges of Mt. Baker's northern slopes glassing for goats with my spotting scope. I even did a few practice stalks. Come October I thought I was ready. There were, however, a few errors in my plan. Errors that almost proved fatal.

My equipment was top quality for this hunt. Jansport D-3 pack, North Face Polarguard sleeping bag, full length Thermo-Rest sleeping pad, and my tent, a Jansport 2-man Trail Dome.

My hunting gear consisted of homemade snow camo, Jennings T-Star 65-lb. hunt-

Continued on page 60

Consider:

Poisons In The Pantry

Potatoes, lima beans, peanuts and other foods can be harmful under certain circumstances . . .

By Leo Weiss

(Drawings by Rossana Lucido)

DO YOU KEEP poison in your larder? Before you answer "No" so quickly, consider that potatoes, lima beans and peanuts could all be poisonous under certain conditions. Of course, an excess of such things as common salt may also be harmful. Also poisonous are apple seeds, rhubarb leaves, and more. So, read on.

Apple seeds contain *cyanide*. This is the poison which, as a gas, is used in some states to execute condemned prisoners. The seeds contained in just one or two apples would not hurt you, but there are cases on record of people saving the seeds and taking a lethal dose, between $\frac{1}{4}$ and $\frac{1}{2}$ cup of seeds. The pits of cherries,

peaches and plums all contain the same poison. The fatal dose for children could be as low as five seeds, if the seed capsule has been broken. A man was reported in serious condition after having consumed 45 apricot pits which he had roasted.

Some foreign lima beans contain 300 mg of *hydrogen cyanide* per 100 grams of beans. In the U.S. the standard set for white lima beans is 10 mg per 100 grams. The dried root of casava (for tapioca) may contain 245 mg per 100 grams of root. Hydrolysis and leaching may reduce the level to 1 mg per 100 grams. Still, a steady diet of these, as with many other foods, is to be avoided. Moderation and variety are key watchwords to follow in planning your fare.

Potatoes contain the glycoalkaloid *solanine*, which is highly poisonous. It concentrates under the skin of sunburned and spoiled potatoes, turning them green, and in the potato sprouts. Always peel suspect potatoes to the depth of the green part, and boil them. Boiling leaches out the *solanine*, and it can be discarded with the water, because heat alone will not destroy this poison. The same poison is found in a related plant, the tomato. It's leaves, stems and shoots are very toxic, although the ripened fruit may always be eaten safely.

Another plant in the same *solanum* family is the eggplant. The leaves, stems and flowers contain the same *solanaceous alkaloids*, and the raw fruit may also. So, to be safe, always pick healthy, ripe fruits and cook them before eating.

Rhubarb pie is delicious, but beware the leaf blades. They contain *oxalic acid* and soluble *oxalates* of potassium and of calcium. Again, heat does nothing to remove this poison, and large amounts can cause death. So, discard the leaves. Spinach and lambs quarter (a potherb), are examples of other vegetables containing *oxalates*, but eaten in moderate quantities, they seldom cause problems.

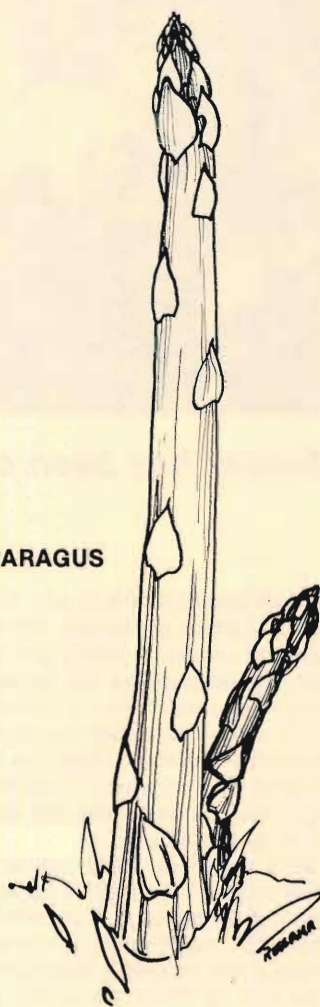
In the South, poke greens are popular. Folks there know they must be boiled in two waters which are discarded, or you can get plenty sick. The plant contains the bitter glycoside *saponine*, and a *glycoprotein*. The ripe berries can be cooked to make pies, but they are dangerous for children to eat raw.

The raw young shoots of asparagus have caused dermatitis. The red berries of the same asparagus plant have caused poison-



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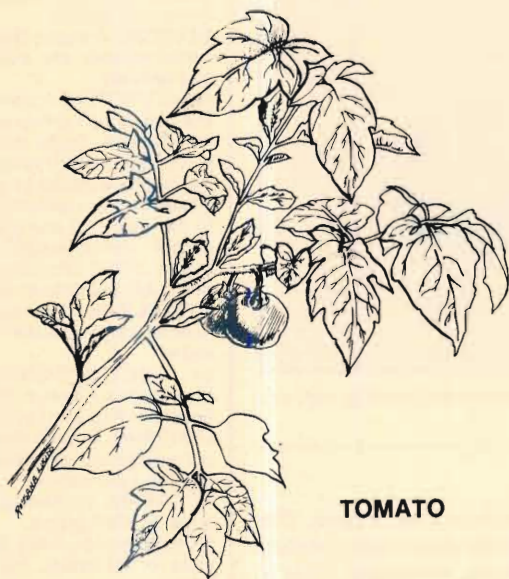
ASPARAGUS



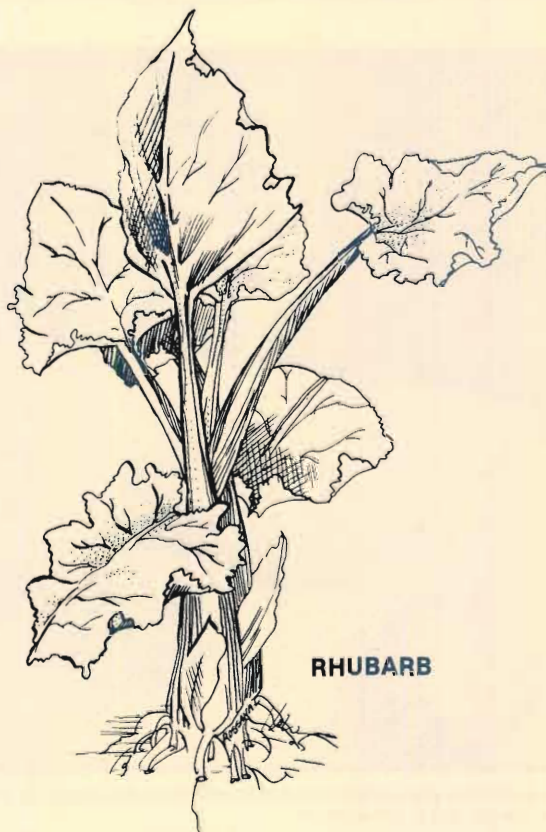
AMANITA MUSHROOM



MISTLETOE



TOMATO



RHUBARB

ing in cattle, and again, children should be taught not to eat this one either.

Onions in large amounts, or as the sole ingredient of the diet over a couple of weeks time can cause severe problems. There have been reported deaths in cattle which ate large amounts. The toxic principle is thought to be an *alkaloid* which causes a severe anemia in man, as well as digestive disturbances and/or stomach upset.

Mustard greens can be a springtime treat, but be prudent; large amounts can cause severe irritation to the mucous membranes of the intestinal tract. Also, mustards, along with cress, and all the cabbage family of plants, can accumulate dangerous levels of *nitrates* and cause goiter problems.

Toxic Nutrient Levels—Vitamins and minerals are essential for life and good health. True? Of course, but what some people may not be aware of is the fact that most minerals, and the fat-soluble vitamins, especially A and D, stay around in

the system, and are not excreted as readily as the water soluble vitamins.

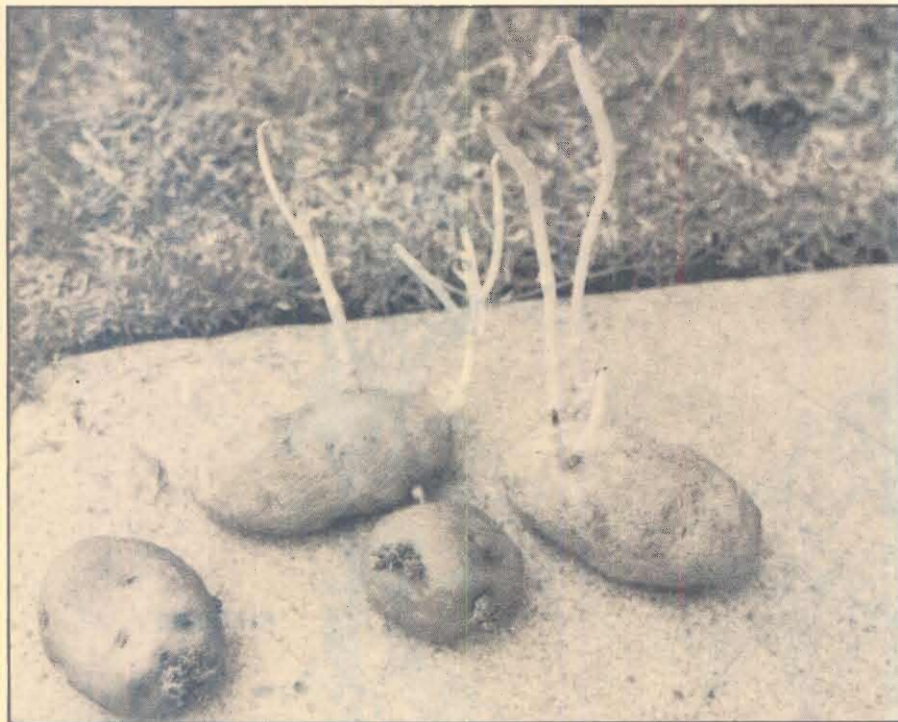
They enter the body's cells, and accumulate, and all have an upper limit where they become toxic. This rarely occurs when receiving these essential nutrients from food. It happens when taking these substances in pill form, as a supplement to the diet, without due regard for quantity taken in.

Keep iron pills and vitamins containing iron away from children. As few as six to twelve pills can cause death in a child. In fact, iron in pill form is second only to aspirin as a leading cause of poisoning in children and can cause problems for adults as well, taken in megadoses. (Men are more susceptible than women, because of their lower requirement for iron.) Measurements are important. Take no more than one RDA of the minerals and fat soluble vitamins per day in supplement form. Remember, it's the toxic level of vitamin A in polar bear liver that makes it fatal for humans to eat.

In times now past, mankind has had to

deal with several types of food poisoning which are rarely seen with the FDA looking out for our food supply. The effects following the pasteurization of milk, and the widespread use of refrigeration have also lessened the dangers. For instance, *ergots* are fungi which parasite the seed heads of several cultivated grains and native grasses. Modern methods of handling and cleaning the grains, and federal laws against selling of grain containing more than .03 percent *ergot sclerotia* by weight, have made problems rare in this country.

Aflatoxins—A similar fungal disease concerns some *aflatoxins* which consist of a family of 14 naturally occurring toxins. They mainly attack cereal grains and some other crops such as peanuts and cottonseed (a major source of cheap cooking oil), when these crops have been exposed to a high moisture condition. Thousands were sickened in Russia during WW II by eating moldy grain which had been left standing in fields over winter before harvesting. This substance is associated with liver can- ▶



The poisonous glycoalkaloid *solanine* concentrates under the skin of sunburned potatoes, turning them green, and in the sprouts.

cer, and is the suspected causative factor in many deaths of children in Thailand, according to a study done there. Many kinds of these *mycotoxins* are relatively stable, and survive the processing and cooking of foods containing them. They also survive in the food chain, and cattle, sheep, pigs, as well as several game animals are susceptible, in addition to man. Rainbow trout seem to be particularly prone to concentrate the toxin. Of special concern should be peanuts and peanut butter made from uninspected peanuts.

Trichinosis organisms may be present in raw pork. *Salmonella* organisms may be present in raw meat, fish or poultry. Cooking makes the difference here; it makes them safe to eat. But, care must be taken in handling. If you lay these contaminated foods on a kitchen counter or cutting board, and then cut bread, or vegetables for salad, or other foods which are not then cooked, sickness can result. Wash your hands after touching these foods, and be sure to wash thoroughly every place they touch before they are cooked. It would be a wise idea to have a separate board just to cut bread and other non-cooked items.

Botulism poisoning is caused by anaerobic organisms, especially in spoiled home-canned vegetables and meat. It is also found (rarely) in commercially canned tuna and sausages. Most of the time these

cannot be detected from odor or taste. The toxic substance can be destroyed by boiling from 10 to 15 minutes. *Botulinum toxin* is said to be one of the most deadly biological poisons known to man. A fatal dose can be as little as .1 milliliter. (This is about the size of a single crystal of salt.)

Another food poisoning is caused by *Clostridium perfringens*. It is developed in meat or meat products which have been at room temperature for several hours. It is especially formed in ham, tongue, dried meat, sausage, fish products, milk and eggs. Re-heating will *not* destroy all these toxins, so throw it out to be on the safe side.

Some plants you may find around the house are worthy of mention: Mistletoe, Oleander and Dumbcane (Dieffenbachia) are all poisonous. Oleander is probably the most dangerous. There are stories about boy scouts who died after roasting hot dogs on oleander stems.

This article is intended merely as an introduction for general knowledge. The implications for long-term survival should be obvious. If law and order were to break down in this country, each one of us could become totally responsible for our own food supply. In any case, it is always useful and important to find out all you can about what can be harmful, as well as what is good food. ●

Some Definitions

AFLATOXIN: carcinogenic mycotoxin produced in stored crops like peanuts, by molds.

ALKALOID: Any complex organic base containing nitrogen and usually oxygen especially in seed plants.

ANAEROBIC: Living, active or occurring in the absence of oxygen.

BOTULISM: Acute food poisoning caused by botulinum spores.

BOTULINUM: Spore forming bacterium that secretes botulin.

CLOSTRIDIUM: Genus of mostly anaerobic spore-forming bacilli existing in nature—over 100 species have been identified, few cause disease. *Clostridium Botulinum* is one, *C. perfringens* is another.

DERMATITIS: Rash or inflammation of the skin.

ERGOT: A fungus disease attacking rye and other seed grains.

GLUCOSE: A sugar, the usual form in which carbohydrates are assimilated in humans and animals.

GLYCOPROTEIN: A complex protein in which the non-protein group is a carbohydrate.

GLYCOSIDE: Sugar derivative containing a non-sugar group through an oxygen or nitrogen bond, released as glucose.

GRAIN: In measurement, roughly equivalent to the weight of one grain of wheat.

GRAM: Metric weight equal to 0.035 U.S. ounce, 1/1000 kilogram, and nearly equal to one cubic centimeter of water.

HYDROLYSIS: The splitting of chemical bonds by adding water or the components of water.

IU: = INTERNATIONAL UNIT used to measure vitamin A before chemical analysis was possible. Replaced by R.E. qv.

LEACHING: Method using water to percolate out soluble compounds as lye from ashes or tanning from acorns.

KILOGRAM: kg Metric measure of weight equal to 1000 grams.

MDR: Minimum Daily Requirement (of vitamins or minerals). May be different from RDA.*

MICROGRAM: One millionth of a gram.

MILLIGRAM: 0.001 gram abr. mg.

MILLILITER: 0.001 of a liter.

MYCOTOXIN: Any poison produced by a fungus, esp. mold.

OXALATE: A salt or ester of oxalic acid (a strong poison).

PATHOGENIC: Disease causing.

RDA: Recommended Daily Allowance, set by federal standards.*

RE: Retinol Equivalent, newer method for measuring vitamin A.

SALMONELLA: Any of a genus of aerobic bacteria causing food poisoning.

TOXIN: A poisonous substance.

TRICHINOSIS: Disease caused by a nematode worm (trichinae) marked by muscular pain, fever and edema (swelling).

TRICHINAE: Nematode worm parasitic in voluntary muscles in meat eating animals like man and swine.

*The guidelines are different for each country.

RECOMMENDED READING:

American Survival Guide, Jan. 1985, P.10,

"What if . . . ?"

F.D.A. *Consumer Magazine*, U.S. Government Publication (Monthly).

"HOW SAFE IS THE FOOD IN YOUR KITCHEN?", Beatrice Trum Hunter, 1981, Charles Scribner & Sons, N.Y.

Repairing Windmills And Pumps

Many times a well can be serviced without special tools . . .

By David Alloway

ALTHOUGH THERE ARE many articles and books that cover finding natural water sources in critical situations, few deal with the problem of acquiring water from a well when the pumping mechanism is not working.

This information is also valuable to people who use windmills or pumps on their retreats in times when hiring or contacting service personnel is not possible. Many times a well can be serviced by the owner without special tools or the high prices many service companies demand.

One of the best arguments for using well water is that it is generally much safer to drink than surface water. Using machinery to draw water, despite its advantages, does have drawbacks to consider. In severe water shortages always remember that hard work advances dehydration, and tinkering with machinery can cause large energy expenditure without guarantee of success. In some cases it may be wise to seek out natural water sources.

Since much of the North American continent is used for livestock and crop production, both needing plentiful and constant water supplies, the chances of encountering wells in agricultural areas is likely. In many areas windmills are still in common and reliable use. Neglected windmills may be found in disrepair but sometimes can be fixed with nothing more complicated than a rock. The first step is to make sure the mill is turned on.

If the tail of the windmill is parallel to the fan, the mill is shut off. There will be a brake in the form of a lever or windless near the bottom of the tower with a heavy gauge wire leading up to the motor. Release the lever or loosen the windlass until the tail is positioned at a 90-degree angle to the fan. This frees the mechanism and turns the mill into the wind. It may

take a few minutes for the water to surface as some wells are very deep and worn check valves may have allowed the water to seep back into the well during idle periods. Unless the mill is a booster (to be explained later) the water will normally flow out into a nearby storage tank.

Bad Omen—Sometimes a mill is found that is pumping away but not producing a drop. This is usually a bad omen of a broken sucker rod or a hole in the pipe; neither of which can be fixed without the proper tools or machinery. With a little luck it could be nothing more serious than some debris stuck in one of the check valves holding it open. A windmill's check valve looks much like a ball or sewing thread spool in a cage. Most windmills have two check valves. One is seated in the bottom of the cylinder, the other attached to the sucker rods to make it move up and down. Most pumpjacks also have this arrangement.

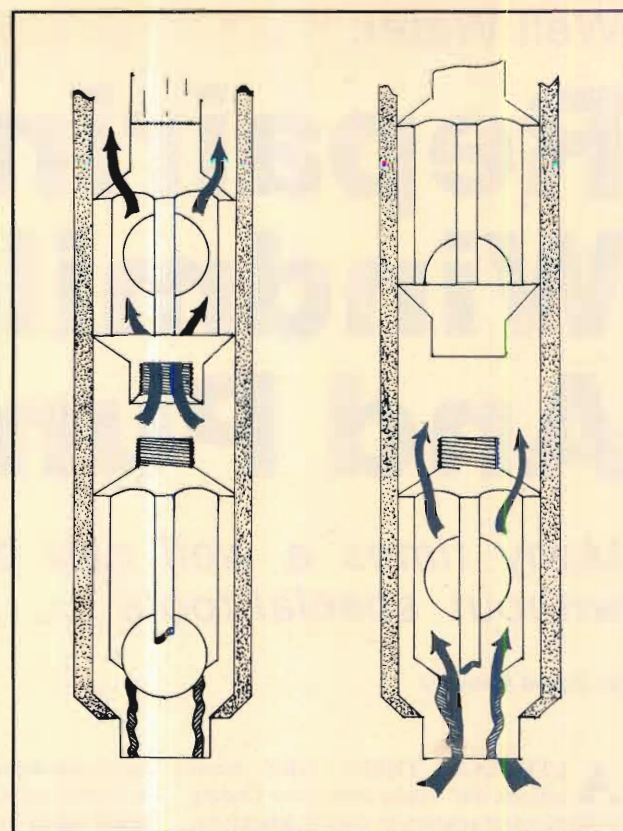
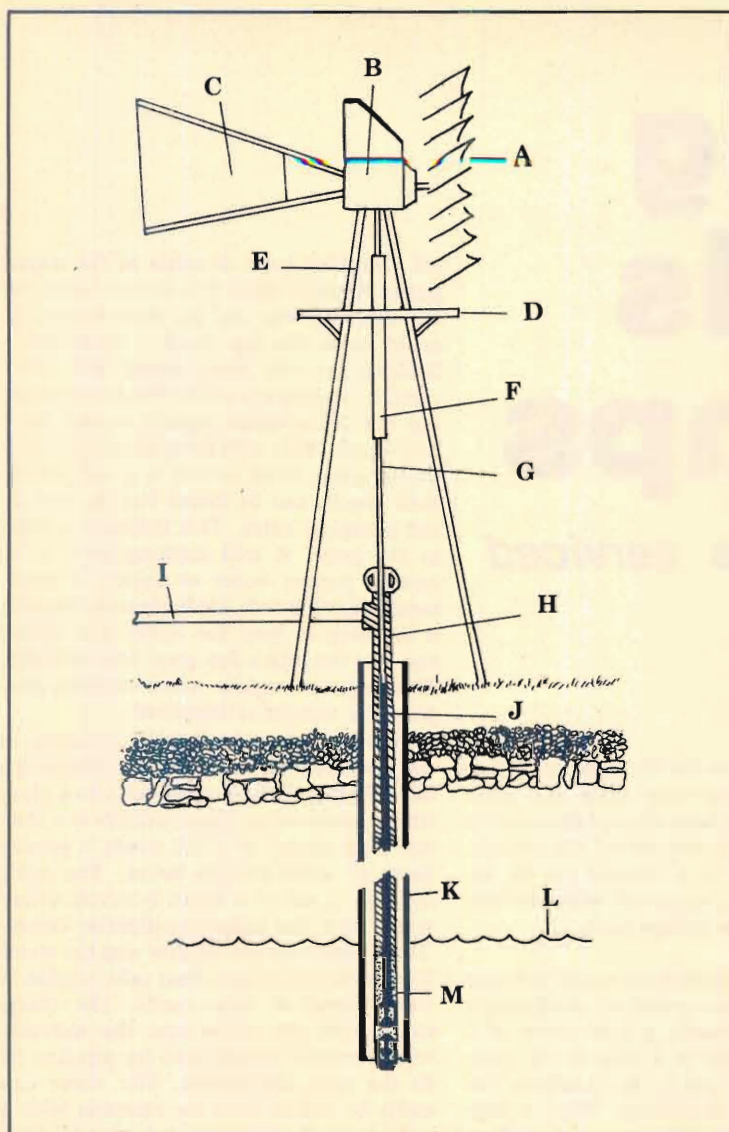
The bottom check holds water in the cylinder, letting it in but not out. The top check plunges down on the water held in the cylinder and opens. On the upstroke the top check closes, creating suction which opens the bottom check and draws more water into the cylinder for the next stroke. If pebbles, trash, or other debris are stuck in either check, holding it open, this exchange system will not work and will prevent the mill from pumping. It is often possible to dislodge such obstructions by taking a heavy object, such as a hammer or rock, and striking the pipe where it comes out of the casing.

It is also possible to diagnose this problem by pressing an ear to the pipe and carefully listening. On wells that are not extremely deep the check valves can be heard as they work. The checks will give

off a muffled buzz or rattle as the water passes through them. If a buzz is heard on the upstroke but not the downstroke, it could mean the top check is obstructed. Striking the rods may remedy this. Conversely, hearing a buzz on the downstroke but not the upstroke signals a stuck bottom check. This calls for a few sharp raps on the pipe. More serious is a well where both checks can be heard but the well is not pumping water. This indicates a hole in the pipe. A mill stroking away that neither pumps water or makes a buzz means that the rods are broken or the well is too deep to hear the valves. Go ahead and give the pipe a few good licks anyway. This does not require much exertion and does give meager satisfaction!

Another type of windmill common to areas where long water lines are used is the booster mill. This is a mill put into a pipeline to boost water along; usually to a storage tank on top of a hill where it gravity feeds to water troughs below. The mill's cylinder is set in a small reservoir where water from the supplying pipeline enters. These reservoirs are shallow and the water level is controlled by a float valve similar to those found in toilet tanks. The check valves suck the water from the reservoir and compress it back into the pipeline on to the next destination. The water can easily be bailed from the reservoir with a container. If the reservoir is empty, look around for a valve in the pipeline which may be shut off. It may be necessary to follow the pipeline to its origin. The tank or pump supplying the water may be shut off. Many pipelines can be followed with ease by looking for piles of rock, earthen mounds, or cleared brush. Many pipelines also have "risers" installed in high spots. These are small pipes that surface above ground level with removable caps or pit-cocks so air can be released which would otherwise block the line. After the air is let off, these risers can spew a geyser of water several feet into the air. Open these along the way; they could shorten your trip.

A windmill without wind is still scenic, but hardly helpful to your plight. If the well is shallow it will be worthwhile to try turning the fan by hand. The combined weight of sucker rods and long water column makes deeper wells virtually impossible to work by hand. When climbing windmill towers always test their strength as you go. Some old wooden towers are rotten and some newer ones may be missing bolts or braces from hurried servicing. Either situation can bring the whole structure down on you, totally negating your need for water. ▶



LEFT—Windmill anatomy is as follows: (A) Fan; (B) Motor; (C) Tail; (D) Platform; (E) Tower; (F) Red Rod; (G) Polish Rod; (H) Pipe; (I) Flow Pipe to storage tank; (J) Sucker Rod; (K) Casing; (L) Water Level; (M) Cylinder with check valves inside.

ABOVE—Here is a check valve exchange. On the downstroke, left, the bottom check seals, holding water in cylinder. Top check opens to allow water to pass. On the upstroke, right, the top check seals, creating suction, causing bottom check to open and draw water from the well. Top check also pushes water column up the pipe. The checks have male and female threads so bottom check can be retrieved without pulling pipe.

Many windmill towers are covered with oil spilled while servicing the motor. Watch your step! If there is a short piece of rope available, take it up to use as a safety belt. *Do not tie it to the tower.* Loop it around the tower like a lineman's safety belt. The brake must be released to work the mechanism freely, and should a sudden wind rise, the mill will turn into it. The person at the top will need to be able to move freely to avoid being hit by the shifting machinery. For obvious reasons, never work on or around windmills when an electrical storm is threatening.

Submersible Pump—Some water systems feature a windmill with an electric submersible pump attached to the bottom of the cylinder. This is a handy arrangement as the pump is a backup in still seasons and the mill can aid in power failures. The main detraction of a submersible pump is the obvious fact that it will not work without electricity. They are also sensitive to deviations of their prescribed voltage and amperage. Lightning often causes a damaging power surge that leaves such pumps useless. In the event of

nuclear attack, power surges from electromagnetic pulse (EMP) that are far greater than any bolt of lightning can be expected.

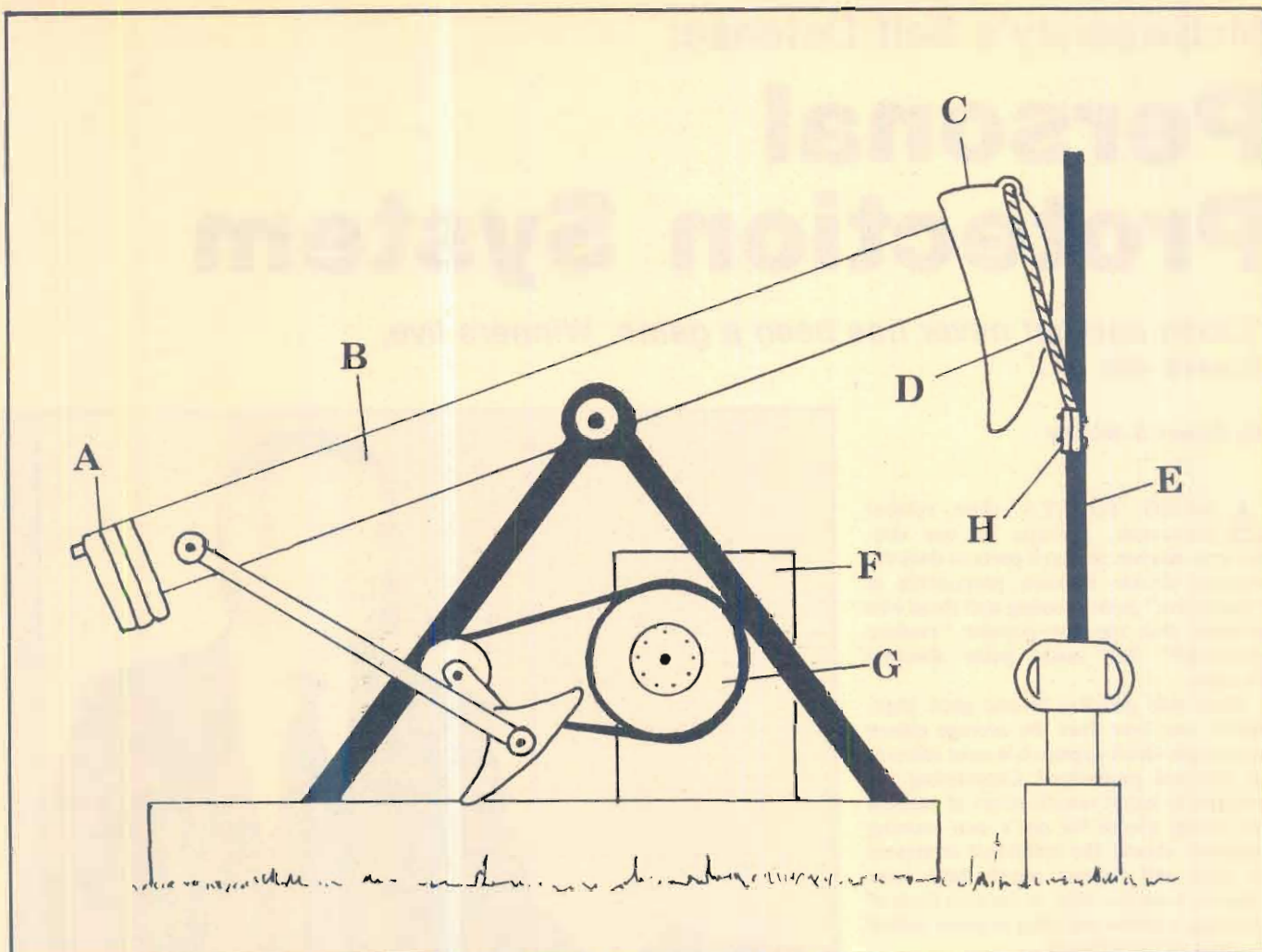
Many electrical pumps are protected from lightning or line surges (because of warranty requirements) by fuses, breakers, or lightning arresters between the power pole and motor. Although these are effective for their intended purpose, they may be useless against EMP. The electrical pulse produced by a nuclear explosion is so quick and intense that normal line protection may not arrest it before damage is done. Since submersible pumps are connected to long lengths of pipe and wire, both optimal EMP collectors, the pump may be burned out even if the pulse is stopped from coming off the line.

Still, many submersible pump owners keep extra fuses in the electric box at the site, and it is no physical effort to replace one on the chance the pump has survived. This, however, would be sheer luck. I worked my way through college building rural electric and phone lines, and after living on numerous ranches, I doubt there would be any pole line service at all. On some rural lines a good rain can knock out

power for days, so don't expect it to survive nuclear weaponry!

Another combination is the windmill and pumpjack. The pumpjack is also insurance against windless days and is either electric or internal combustion. The internal combustion type use gasoline or LP gas, although not necessarily interchangeable. The electric types are not as picky about current as their underground counterparts, are more resistant to EMP, but are still dependent on an electric source. Internal combustion jacks are sometimes used in combination with a submersible pump, and sometimes a windmill is included in this combination. All of the previously mentioned machines can also be used alone, so do not depend on sighting windmills to locate them. Electric powered wells are easily found by following their supplying power lines.

If a pumpjack is found alone it may be assumed it is ready to go, although some repairs or adjustments may be necessary. If the jack is found under windmill, however, it may not be connected to the tower and may need proper steps taken to make it work. Some tools such as adjustable



Pumpjack anatomy is: (A) Counterbalance Weights; (B) Walking Beam; (C) Horsehead; (D) Bridle; (E) Polish Rod; (F) Power Plant; (G) Flywheel; (H) Polish Rod Clamp.

crescent wrenches are needed. Since most pumpjacks used in conjunction with windmills are expedients, they require much work to keep them running. For this reason many ranchers and farmers keep the necessary tools stashed near the site.

The first step in converting the well over to a pumpjack is to climb to the top of the tower using the same safety precautions mentioned earlier. Turn the fan until the rods are on full bottom stroke and then turn it a little more until they rise two inches above full bottom. If only one person is working on the project it will be necessary to tie or chain the fan off to the tower to hold this position. While up on the tower look for a two-by-four or small diameter length of pipe bolted to the rods a few feet below the motor. This is called the *red rod* (although it is seldom red), and is purposely made weaker than the sucker rod. This way if the mill ties up in some way the red rod will break above ground instead of the sucker rods down in the hole which would call for pulling the pipe.

With the rods lifted to their proper height, turn the pumpjack's flywheel until the walking beam (the beam on top that

goes up and down) is on full bottom stroke. The rods are lifted two inches to prevent the top check from hitting the bottom check and wrecking the apparatus beyond immediate repair.

The next step is to connect the bridle, which is a cable looped with a clamp on the ends, to the horsehead. The horsehead is the foremost attachment on the walking beam, and since it looks like a horsehead, it should be no problem identifying. Figuring out how the bridle is looped over the horsehead should be no obstacle either. The clamp on the bridle will attach to the polish rod. The polish rod is the smooth steel rod that comes out of the pope and attaches to the sucker rods down below.

As the bridle is clamped in place, be sure to take all the slack in the cable to keep the top check from falling out of its set position. When this whole mess is in place, disconnect all of the rods (usually the red rod) above the polish rod and tie them to one side of the tower out of the way. Now attempt to start the pump. In this stage a few crossed fingers, talismans, and prayers are in order. Since the jack is already in place there will probably be no

need to counterbalance the beam.

Purify The Water—The safer quality of well water over surface water was mentioned earlier. But this does not mean that well water is 99.33 percent pure. While bailing wells to remove silt, sand, and debris it is not at all uncommon to find rodent and bird bones. The same applies to drinking out of stock tanks and water troughs.

Once while I was riding out a water line on a ranch I worked on, I did what is very common to ranch cowboys. I paused to get a much needed drink at a new clean stock tub. My thirst well sated I rode my horse on down the line to the water tank that supplied the tub I had drink from. There I found a javelina that was several days dead slowly dissolving in the otherwise clean water. Get the point? Always purify.

As can be seen from this article it is not always necessary to dig in dry stream beds to find water, nor is it always needed to call out a service crew that may charge \$40 per hour to beat a pipe with a hammer. Knowing just a few tricks used by well servicemen can save dollars or lives, depending on how dire the situation is. ●

McSweeney's Self Defense:

Personal Protection System

'Close combat never has been a game. Winners live, losers die . . .'

By Robert S. McKay

AMONG TODAY'S close combat instructors, perhaps no one controversy receives as much press as does the ongoing debate between proponents of "instinctive" point shooting and those who contend that the now-popular "modern pistolcraft" has made point shooting obsolete.

Each side provides several good arguments, but how does the average citizen determine which approach is most relevant to personal protection? Considering the potentially lethal ramifications of making the wrong choice for one's own training regimen, should the individual interested in basic self defense merely take some expert's word for what is the best form of training, without engaging in some critical analysis of the subject?

Absolutely not! Any student of logic can tell you that any argument or theory—be it about handgunning or farming—is based upon some *premise* or basic foundation, and this is true of both the instinctive method and the newer competition methods. By closely examining the premises which both schools use as a foundation, the average person can determine for himself whether the old methods are obsolete or the new methods irrelevant.

Self-Defense Unlimited—One instructor of close combat who has examined these premises very closely is John McSweeney of Elmhurst, Illinois, chief instructor of Self-Defense Unlimited. To say that McSweeney's school is unique would be an understatement.

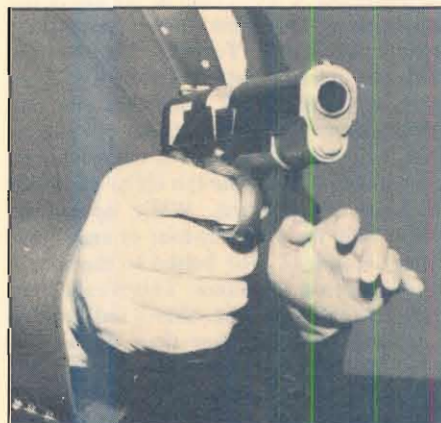
In addition to being a 6th degree black belt instructor of combat karate, McSweeney is also a weapons expert and a veteran of three branches of the U.S. armed forces; he served as a 20mm gunner on an amphibious ship in the Navy during WWII, spent four years as an Air Force bodyguard in the Far East during the Korean War, and then served seven years as a Captain of infantry in the Army. He is also the author of *EXECUTIVE PROTECTION*, a book on handgun training for executives and bodyguards, and currently stars in a Cable TV series in the



Unlike some forms of "hip shooting," McSweeney's method requires that elbow and forearm be kept in, toward the center of the sternum, making it possible for the shooter to "sync" the focus of vision on the target and the direction of the muzzle.



McSweeney advocates a tight grip with one hand but maintaining an unlocked wrist. He teaches students to pull the trigger rapidly instead of jerking it or squeezing it too slowly.



Although he generally recommends the .38 Special revolver for students, McSweeney still likes the Colt .45 semi-auto for its reliability, stopping power and ease of reloading.



Self-Defense Unlimited offers combat karate training as well as close quarters handgun training.

Chicago area entitled, "In Defense of Yourself."

While McSweeney continues to teach karate to his students at Self-Defense Unlimited, he is a strong advocate of the handgun for personal protection. "Karate has its place as the tack-hammer," he points out, "but the gun is the sledge-hammer of personal defense."

And what does John McSweeney, trained in the use of the handgun by elite OSS (now CIA) instructors during the 1950s, think of the techniques used in modern competition?

"Nothing amuses me more than the photos of today's handgun competitors holding the gun with two hands and carefully aligning the sights while their bodies are placed full-on to the opponent. The sad part is that this improper training method is the reason why 75 percent of all police shots fired in combat miss their target. Handgun fights occur at very close range (90 percent within 5 yards) and generally at night or indoors with low lighting conditions. Did you ever try to align sights at night? Do you think your central nervous system is so stupid that it will allow you to take the time to aim when someone is shooting at you from close range? What you'll do is what everyone instinctively does—begin firing as soon as the weapon clears the holster! If you haven't been trained in the instinctive firing method, you'll jerk the trigger, the muzzle will jump, and your rounds will go wild."

McSweeney is quick to point out that the very premise upon which the new competition methods are based bears little correlation to the known realities of combat. Some of the major facets of the new methods—two-hand Weaver Hold, the exclusive use of the sights, a reliance on heavy caliber automatics, and the straight-

legged, full facing stance—were designed and applied in sport competition, under a set of psycho-physical conditions totally divorced from those one can expect to encounter in life or death combat.

"The major problem with the new sport methods," says McSweeney, "is that training is based on the wrong premise, that premise being the mistaken assumption that there is a direct correlation between target shooting and actual combat shooting. There really is no correlation, even though most law enforcement agencies continue to think so. The FBI statistics on handgun fighting are very illuminating; in most shootouts, police miss with three out of four shots! If target shooting of any kind were an effective method of combat training, surely it is reasonable to expect that the police who use it would have better than a 25 percent hit rate? When you go on to consider that 50 percent of all gunfights occur within five feet, 90 percent within five yards, and 75 percent in darkness, the miserable overall accuracy of police fire does not speak well for target shooting techniques, be they Bullseye, PPC, or IPSC. Unless training methods are changed to reflect reality, these statistics will remain the same."

And what, according to John McSweeney of Self-Defense Unlimited, is the "reality" of close quarters shootouts?

Tachy-Psyche Effect—"The basic realities of gunfighting are well known to psychologists but generally ignored by today's handgun experts," McSweeney explains. "It's called the 'Tachy-Psyche Effect,' which means that when an individual comes under the threat of instant death from an immediate source, some complex and strange psycho-physiological events take place:

1) *Time/Space Distortion Sets In.* Things in the immediate environment seem closer than they are, and everything seems to move in slow motion.

2) *Auditory Exclusion Takes Effect,* blocking out all sounds except those directly related to the threat; even shouted commands can't be heard.

3) *Tunnel Vision* forces the eyes to concentrate on the threat to the exclusion of all else.

"This last effect, tunnel vision, is the key to understanding proper combat shooting methods. It is a physical impossibility to look at the front post of your sights when someone is actually firing at you from five feet away. Tunnel vision takes over and all you can look at is the threat to your life. Even at 5 to 10 yards, this is the case, and almost 100 percent of all documented handgun battles occur at ranges of 10 yards or less. Remember also that three-fourths of those are also in the dark. So much for sights!"

This sequence of mental and physical events—the Tachy-Psyche Effect—is almost universally ignored by today's combat competitors because such unique mental states can't be "simulated" in the match setting. Most advocates of the "modern pistolcraft" are inclined to believe that techniques efficient in sport competition will somehow "override" the Tachy-Psyche Effect, while others are simply doubtful of its existence.

"But the Tachy-Psyche Effect has been well-documented over the years, and it is not 'new,' either; Capt. W.E. Fairbairn, one of the pioneers of combat shooting and literal creator of the British commando schools, was well aware of the effects of the Tachy-Psyche phenomenon, although it wasn't so-named at the time. For this reason Fairbairn and, later, Col. Rex Applegate at the OSS in WWII, continued to advocate the instinctive point shooting methods even as the "newer" competition methods gained greater popularity.

"You won't be cool, either," McSweeney goes on, describing the facets of gunfighting which accompany the Tachy-Psyche Effect. "Not the way you were last week on the practical pistol course where you hit every target, won a trophy, and felt so proud of your great shooting ability. No, not cool. Instead, you'll shake, you'll tremble, and you'll stare at the threat. Hopefully you'll at least shoot back, although you'll jerk, not squeeze, that trigger, and the muzzle will jump and your round will probably go wild. I say 'hopefully' you'll fire back, because in many recorded cases police officers became hypnotized from shock and never once

Continued on page 67

Herbal Medicine

These plants were the only help available for injury and illness in years gone by . . .

By George D. Guillory

(The author wishes to thank Lyn Rathburn of The Herb Desert in Houston, Texas, for supplying samples of photographs and answering innumerable questions.)

WHEN WE THINK of herbal medicine, we tend to think of old-fashioned cures that have become outdated because of the advent of modern drugs.

While one may have an adequate supply of modern drugs stockpiled, a long emergency may deplete this stockpile. One way to stretch these supplies, or to ultimately replace them, may be through the use of herbal medicines.

People of all cultures have older relatives that remember herbal cures that were the only help available for injury and illnesses in the years gone by. Several of the herbal cures have been recently rediscovered.

American Indians knew of the value of birch bark as a pain reliever and for good reason. Birch bark contains methyl salicylate, a close relative of acetylsalicylic acid, from which western doctors discovered aspirin. Recently a drug called Padma 28 has been approved for use by the IKS, the Swiss equivalent of our FDA. According to Dr. D.F. Hurlimann, a cardiovascular specialist from Lucerne, Switzerland, the drug "... promotes the formation of new blood vessels that bypass blocked arteries." This drug has been used by Tibetan monks for several hundred years and has just been recently "discovered" by western doctors.

While the identification of beneficial herbs and the knowledge to use herbal medicine would seem to take several years of intensive study and research, there are several herbs that a well versed amateur can use with a minimum of knowledge.

It would be beyond the scope of this article to discuss all of the plants in the U.S. available for medicinal purposes. This article will concentrate on seven simple herbs that the average person can utilize with a minimum of skill. They are: aloe, angelica, birch bark, comfrey, garlic, rosemary and white horehound.

Before discussing the medicinal properties of these herbs thought must be made to the administration of herbs. The three most common ways to administer herbal medicines are in the form of tinctures, infusions and salves.

TINCTURE. A tincture is made by using grain alcohol to dissolve the beneficial chemicals out of the herbs. The process is to take the herb, grind it well, and

mix with alcohol in the ratio of 4 ounces of herbs to 1 pint of your favorite spirits. Place the mixture in a jar with a tight fitting lid. Leave the jar in a dark place, such as a cabinet, and shake the jar twice a day. After two weeks strain the liquid and discard the herbs. The mixture may be stored in the original jar, but a more convenient way to store and dispense the tincture is from an eyedropper bottle. These bottles can be purchased from most local pharmacies. One or two eyedroppers full is the average dosage for most herbs.

INFUSION. An infusion is similar to making tea, except that an infusion is never boiled. Because of the volatile nature of the alkaloids in herbs, boiling would break them down. The ground herbs may be put directly into the water or a tea ball may be used. The usual ratio of herbs to water is 1 ounce herbs to 1 pint of water.

SALVE. The third way to administer herbs is in a salve. A salve is used to topically apply herbs to skin problems, such as cuts, rashes, insect bites or stings. To make a salve take 1 pint of olive oil and bring to just below the boiling point. Add 2 ounces of well ground herbs and hold at this temperature for two hours. After the two hours, strain herbs from the oil and return the oil to the pot. Discard the herbs. Then add clean beeswax in the proportion 1½ ounces beeswax to 1 pint of the oil. Since the salve will be used on open wounds add 1 tablespoon of tincture of benzoine or gum benzoine to the mixture. While the salve is still warm place in small jars, something similar to baby food jars will do nicely, and tighten the lids while still warm. These sealed jars should have a shelf life of several years. While olive oil is mentioned, almost any vegetable oil can be used including corn, safflower, wheat germ and others. Animal fats and oils should not be used because of their ability to harbor bacteria easily.

As stated earlier these seven herbs are simple for the average person to collect. Some are used as seasonings in ethnic foods. These spices are angelica, garlic, rosemary and white horehound. The latter, white horehound, is used in the Passover feast by the celebrating Jews. Aloe Vera is a popular ornamental plant for the house. And the shade tree in your back-

yard may be a birch tree. Let us look at each herb individually where suggested medicinal purposes and dosage form recommended by leading herbalists will be discussed.

ALOE (*Aloe Vera*) (*Aloe Giganticus*). While most of these plants are used as ornamentals they have great healing properties for skin conditions. While almost any member of the Aloe family can be used, most herbalists agree that Aloe Vera and Aloe Giganticus have the best healing properties. Aloe is the best herbal medicine available for minor cuts and burns. It is also useful for soothing insect bites, cases of poison ivy, diaper rash, heat rash and sunburn. Even if Aloe is applied sometime after the burn, it still has a beneficial effect.

The best way to use Aloe is right off of the plant. Cut a section of a leaf enough to do the job, don't worry, the plant will heal. Then peel the cover off the leaf and apply the gel directly to the wound. Minor burns and rashes heal faster without a bandage. However, if contamination of the wound by dirt and dust is expected, a light gauze pad would provide the best protection.

ANGELICA (*Angelica Archangelio*). The best property of this herb is its ability to relieve muscle spasms and cramps. This makes it ideal for people who have done unaccustomed strenuous work, or for women who are having uncomfortable menstrual cramps. It also has limited ability to suppress coughs. These benefits are gained by taking Angelica by an infusion. In tincture form it is a safe stimulant, when taken in moderation. However, women who are pregnant should not take Angelica as it promotes menstruation.

SWEET/BLACK BIRCH (*Betula lenta*) or SILVER BIRCH (*B. Alba*). An excellent pain reliever is made from these birch barks. Infusions using the leaves, buds, and bark contain methyl salicylate from which aspirin was derived. When making an infusion, or drying birch parts, be careful not to use heat. Heat will break down the volatile oils in the bark and leaves. When used and stored in tincture form, it is a readily administered and transported pain reliever, excellent for hiking and camping.

COMFREY (*Symphytum Officinale*). If you would ask a knowledgeable herbalist



Adult Comfrey (*Symphytum Officinale*) can be identified by its veiny leaves.



This is a specimen of Giant Garlic (*Allium Sativum*).



White Horehound (*Marrubium vulgare*) is used as a cough suppressant.



Adult Aloe (*Aloe Giganticus*) can grow up to 5 feet in diameter.



A young River Birch (*Betula Nigra*) plant's bark, like the bark of other birch trees, can be used to make an excellent pain reliever.

what was the one herb he could not do without, he would more often than not state, Comfrey. This herb's leaves and roots encourage cell growth. It is also an expectorant and helps soothe inflamed tissues, such as ulcers, when taken in the infusion form. The salve form is an excellent topical medicine for skin burns and insect stings.

ROSEMARY (*Rosmarinus officinalis*). Rosemary has been called nature's sedative. The Europeans used this herb to soothe nervous disorders. As an infusion the Chinese use rosemary as a popular cure for insomnia and nervous stomachs. U.S. herbalists use rosemary to treat headaches and muscle spasms. These benefits are gained by using rosemary in an infusion or tincture form.

GARLIC (*Allium Sativum*). Yes, just regular garlic. Garlic is known throughout the U.S. as a popular Italian spice, but it has much greater uses as an herbal medicine.

Recovery from severe head and chest colds can be facilitated by garlic. In infusion form it acts as an expectorant to clear

up congested sinuses and lungs. For severe congestion take two to three cloves, crush them in your fingertips and add to boiling water that has just been removed from the flame. Place your head over the steam from the pot and place a towel over your head to make a "tent." Results should be evident within five minutes.

The tincture form of garlic also has many uses. Placed on cuts the mixture acts as an antiseptic. Placing a cotton ball soaked in garlic tincture and putting it in the ear is an old-time European remedy for relief of ear infections. Garlic also has been used by many ethnic groups as a cure for intestinal parasites. The procedure is to take 1 to 2 cloves crush slightly with your finger and swallow whole. If the taste is not agreeable, drinking water while swallowing the cloves helps.

WHITE HOREHOUND (*Marrubium vulgare*). This herb was used in the U.S. in a stick form as a cough suppressant and is still available today in some country stores. Horehound's lung clearing and cough suppressant qualities are available in whatever form it is administered. However, because of the "bitter" taste of horehound it is

recommended to use this herb in the cough drop form.

To make old fashioned horehound cough drops you first boil 1/4 cup of ground leaves in 2 cups of water for 10 minutes. Then strain the herbs and discard them. Add twice as much honey as the water that you have left in the pot and stir until smooth. To this mixture add 2 cups sugar and 1/8 teaspoon cream of tartar and stir on medium flame until the sugar melts. Then lower the heat and stir constantly. When a drop of the mixture forms a solid ball when dropped in cold water the mixture is ready. Pour mixture in an appropriate sized baking dish that has been buttered. As the mixture begins to harden score it with a knife so that when it fully hardens it can be broken into squares approximately 1/2-inch square. When mixture is completely cool store the drops in an airtight jar and place jar in a cool dry place. Administer 1 to 2 drops as needed.

Before finishing this article I would like to describe two herbal recipes that will round out the beginning herbalist's remedy collection.

ITCHING and RASH SALVE. Com-
Continued on page 59

ARRL:

Ham Radio

It's no coincidence that hams are experts in emergency communications . . .

By Tom Wolfe

MANAGUA, NICARAGUA was struck by a devastating series of earthquakes, on the morning of December 23, 1972, leveling many buildings in that nation's capital. The resulting catastrophe caused over 5,000 deaths and left another quarter million people homeless.

The quake measured a modest 6.2 on the Richter Scale, but it was a shallow quake centered directly under the city, greatly magnifying the damage. (The San Francisco quake of 1906 was 100 times greater, measuring 8.3 on the Richter Scale, but the Managua death toll was 10 times higher.)

Power was blacked out in most of the nation, the phone system was in a shambles, and government radio stations in Managua were reduced to piles of rubble. News of the catastrophe might take days to reach the rest of the world, and help was needed now!

Word did get out, and quickly. With fires still burning in the shattered city, pleas for aid reached other nations, and it was Amateur Radio that literally saved the day. Hams throughout Nicaragua provided their country's only link to the rest of the world. Some hams relayed emergency messages from Managua, itself. Setting up stations in the ruins of the city, their efforts provided Nicaragua's injured and homeless with tons of food and medical supplies from nations throughout the western hemisphere.

Events around the world are often shaped by the work of ham operators. During the Falkland Island invasion, Argentina's military silenced the tiny islands' only radio station. When the army started making house-to-house searches, they discovered that they had made a slight oversight. They found a ham operator, still at his radio, transmitting news of the invasion to Europe and the U.S.

Time and again, when war or natural disaster strikes, we first learn of world-shaping events via ham operators. Few realize the influence of Amateur Radio, precisely because it has become a part of our daily lives.

It's no coincidence that hams are



ABOVE—This converted recreational vehicle, on loan from the Thurston County, Washington, Sheriff, serves as headquarters for ARRL's Field Day operations.



LEFT—As soon as contact is established with a new station during Field Day activities, the information is logged in this computer inside the sheriff's van.

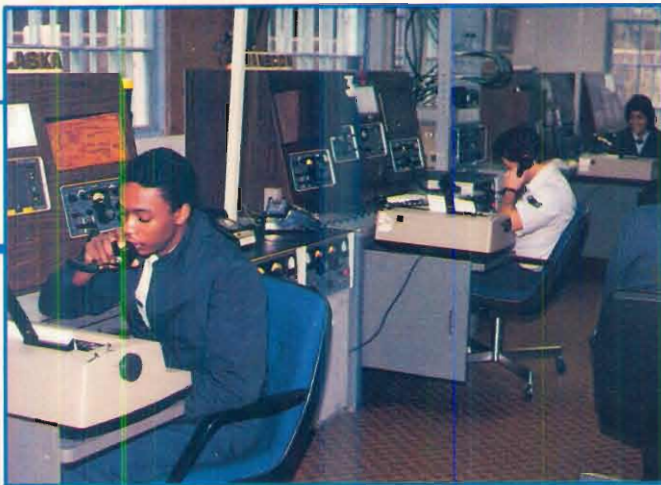
experts in emergency communications. Since the earliest days of radio, amateurs have provided valuable aid in times of crisis. The Federal Communications Commission (FCC) emphasized this when setting down its rules and guidelines for Amateur Radio. Part 97.1 of the FCC Code recognizes "the value of the amateur service as a voluntary non-commercial communication service, particularly with respect to providing emergency communications."

Amateurs take a serious view towards their public service duties. Several ham organizations have been set up to fulfill their commitment. The American Radio Relay League (ARRL) is the largest of these groups. Founded in 1914, it serves to

focus the many aspects of this intriguing hobby.

The ARRL sponsors many national events; the most popular being the annual Field Day with thousands of hams operating stations using emergency generators and portable antennas. The object of Field Day is to refine operating skills and procedures necessary when normal communications are disrupted. Hams set up their rigs at remote sites and try to link up with as many other stations as possible. In a real emergency, they would form an amateur network throughout a disaster area, and coordinate activities with civil defense and disaster relief organizations.

Recently, I attended a Field Day exercise with my local club. Here were a couple



LEFT—MARS station AGA5MC at McCord AFB saw heavy service during the Mount St. Helens eruption. This is part of a six-station U.S. Air Force/MARS continental network.

RIGHT—This Kenwood 2-meter handie-talkie represents the ultimate in sophistication. When used with a local repeater it has a 50-mile range and the touch-tone pad permits access to Ma Bell. A similar unit was used by a Space Shuttle astronaut to talk to hams back on earth.



dozen hobbyists who don't call themselves survivalists but you sure could have fooled me! My guide for the day was John Brown, W7CKZ. John, like many other members of the Olympia Amateur Radio Society, is a "veteran" of Mt. St. Helens. As head of the state's Radio Amateur Civil Emergency Service (RACES) network, he acted as a link between the Washington State Department of Emergency Services (DES) and the Federal Emergency Management Agency (FEMA).

Power was provided by one club member, who arrived with a 5 KW Army-surplus generator in the back of a pickup. Other generators were kept in reserve. When Dwight Clayville, N7CHC, arrived he promptly whipped out his bow and arrow, and shot a 40M antenna up and over a telephone pole. Within minutes, the first stations were on the air.

"We normally set our antennas up using overhanging tree limbs," said Dwight. "But this old power line is ideal." He spent the next hour setting up four more antennas using his bow and fishing reel.

I had heard much about the amount of cooperation existing between ham operators and civil defense organizations, but it came as a surprise when a large motor home pulled into camp marked "Sheriff's Department Mobile Communications Van." Sure enough, the ham club had commandeered the vehicle.

"One of our club members acts as liaison with the Sheriff's Department," Brown explained. "We provide their office with backup communications ability, as well as commo for their Search & Rescue operations. Using repeaters (automatic transceivers) on 6-meter band, we have better coverage than the county DES. We are also affiliated with the state DES, the Red Cross, Civil Air Patrol, and nearby military bases."

As the day progressed, hams took shifts using a dozen radios to make contacts throughout the nation. Fascinated, I watched one keybanger efficiently contact 48 other hams in one hour. He was using a transceiver located in the Sheriff's RV. All

Continued on page 64

LISTENING TO THE HAM BANDS

HAM BAND (METERS)	FREQUENCY (mHz)	TYPE OF RECEIVER NEEDED*	COMMON TYPES OF TRANSMISSIONS
160m.	1.8-2.0	General Coverage	Morse Code (CW) Single Sideband (SSB)
80m.	3.5-4.0	Most Shortwaves	CW, SSB, & Radio-teletype (RTTY)
40m.	7.0-7.3	Any Shortwave	CW, SSB, & RTTY
20m.	14.0-14.35	Any Shortwave	CW, SSB, & RTTY
10m.	28.0-29.7	General Coverage	SSB
6m.	50-54	Lo-Band Scanners	SSB & FM voice
2m.	144-148	Police-Band Scanners	FM voice
—	220-225 and up	Ham Receivers only	FM voice & Slow-Scan TV

*To receive CW and SSB properly, a receiver having a Beat Frequency Oscillator (BFO) is needed. To receive RTTY, the receiver must be hooked up to a teletype or computer with proper software.

MARS & RACES FREQUENCIES

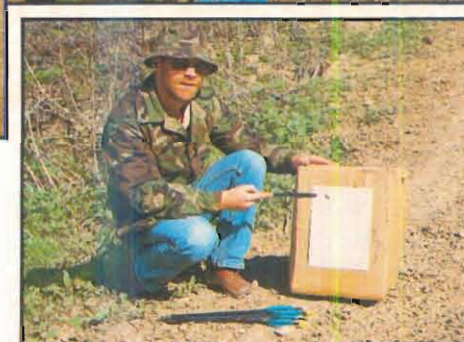
HAM BAND (METERS)	TYPICAL MARS FREQUENCIES (MHz)	RACES FREQUENCIES (MHz)
160m.	—	1.8-1.825; 1.975-2.0
80m.	3.292; 3.299; 3.308 4.517; 4.577; 4.590; 4.594	3.50-3.55; 3.984-4.0
40m.	7.302; 7.305; 7.324; 7.457	7.097-7.125; 7.245-7.255
20m.	—	14.047-14.053; 14.22-14.23
10m.	—	21.047-21.053; 28.55-28.75 29.45-29.65
6m.	49.980	50.35-50.75; 53.3; 53.35-53.75
2m.	143.95; 142.15 & 143.45 (Repeater)	145.17-145.71; 146.79-147.33

From PSE:

CROSSBOW SPORTS

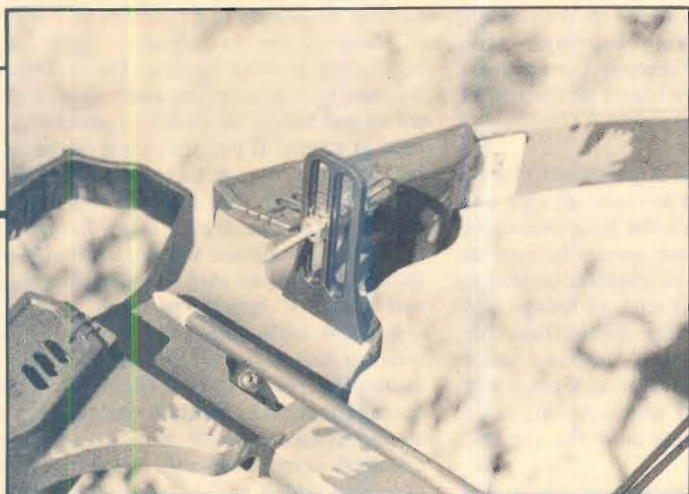
The Sportfire and Flashfire are sturdy, accurate and reliable weapons for hunting or practice . . .

Staff Evaluation

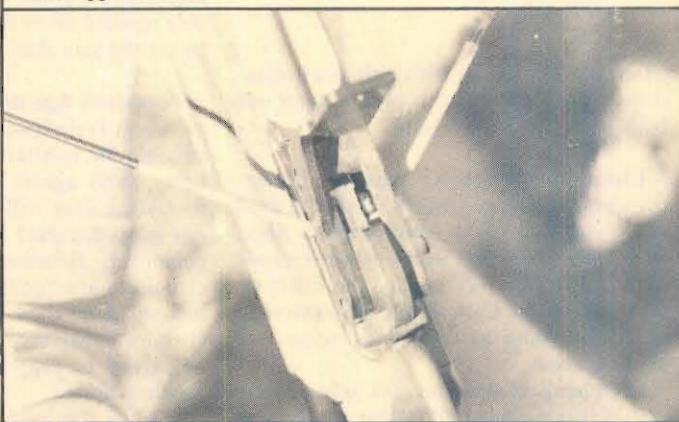


LEFT, ABOVE, ABOVE RIGHT—Cocking, loading and firing the crossbows is simple and requires little effort.

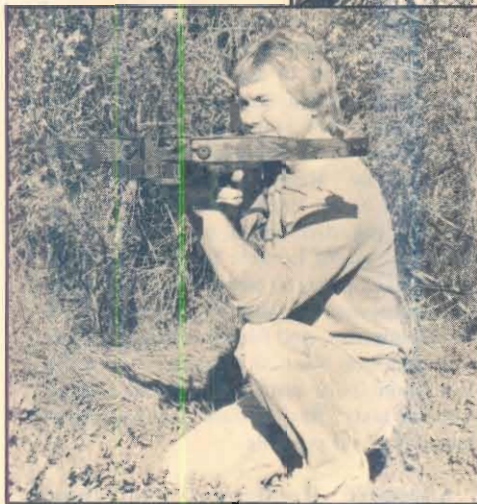
RIGHT—This tester was amazed at being able to make touching hits on a target from about 20 yards, an indication of the inherent accuracy of the weapons.



The bolts rest above the frame without touching it, preventing cable wear. The safety is automatically engaged when the cable enters the trigger latch.



RIGHT, BELOW, BELOW RIGHT—Shooters liked the way the crossbows handled and shot on test firing, which was done from 20 yards or less.



PRECISION SHOOTING EQUIPMENT (PSE) of Tucson is known for its reliable, high quality crossbows. The firm is a leader in design and technology innovation.

Two of PSE's newest crossbows, the Sportfire, meant primarily for recreational shooting, and the Flashfire, a powerful camouflaged hunting weapon, were loaned to ASG staff members for tests and evaluation. The testers were pleased with the look and feel of the weapons and found shooting the was a very pleasant task indeed.

The Sportfire is a crossbow for the whole family to enjoy, especially those family

members learning to shoot one of these bows. It comes in a red pearl or blue pearl finish and with 50- or 80-pound peak draw weights.

The Flashfire is a compact bow with a camouflage finish and a 125-pound peak draw weight. This weapon is intended for hunting game.

Both crossbows have sturdy 27-inch alloy stocks, adjustable cheekpieces, Magnaglass/Graphite limbs, adjustable "CL" sights pins and rear peep sights, the PSE auto-safety feature and step-through stirrups for ease of cocking.

The Sportfire uses 18-inch Fire-Flite 6

arrows, while the Flashfire uses 18-inch Fire-Flite 8 arrows with PSE Super-Nocks.

Shooting—Two separate trips to shooting areas were made by staff members for testing of the crossbows. Staffers were impressed with the performance of the Sportfire and Flashfire, finding each bow accurate—at least within the testing ranges of 20 yards or less. Very tight groups were obtained from these ranges with the crossbows fired from standing and kneeling positions.

"I really like the let-off of these bows," commented one tester, a bowhunter and archery enthusiast. He noted that the cable does not ride on the bolt track during let-off, a problem with other crossbows which ruins cables after only a few shots. The PSE cables held up beautifully during testing and showed no damage whatsoever. The left-off was quite smooth for both bows, he added.

These crossbows come half assembled in boxes and putting them together takes only a few minutes using the Allen wrenches supplied with the owners manuals. Adjusting the cables and centering them and adjusting the arrow rests was likewise simple and quick. Sight pins were also easy to adjust and use with the rear peep sights.

The testers liked the power of these bows. The bowhunter tester remarked that he would feel well equipped to hunt deer with either of these bows. The bolts fly from these weapons at speeds of about 250 feet per second—fast enough to take just about any game hunted with them.

Evaluation—The staff of ASG considers these crossbows to be among the best they have seen, and believe they will provide their owners with long service life, and reliable, accurate shooting performance.

They and other PSE equipment are available at gun shops, sporting goods stores, archery stores and other retail outlets. ●

DECONTAMINATION

Continued from page 33

Often you can get by with only neutralization or clean up, but it is best to carry out both to be on the safe side.

Clean-Up—Whenever possible, protective clothing and gas masks should be used when cleaning up a contaminated area. Remember, too, that water or water vapor used in clean-up will damage the filters on most gas masks. Care should be taken with permeable suits as well since water will damage them.

Let's imagine that the area around your shelter is contaminated. What should you do?

First, avoid further contamination of your shelter area. Don't move into it with contaminated clothing and gear and don't discard contaminated gear near the area you're planning on cleaning up.

Non-persistent chemical agents—those which aren't in a jellied state and which have a low boiling point—will evaporate and usually won't require clean up other than a good airing out, except in times when it is below freezing. By increasing air flow to a contaminated area, or over contaminated objects, you can decontaminate an area covered with non-persistent agents.

Objects which are being aired out should be left in the air, and sunlight if possible, for at least three days in warm weather. The same applies for non-porous surfaces. Earth or other porous surfaces pose another problem since most agents soak into them and evaporate slowly. One route is to dig up and remove contaminated earth. After the earth airs out it is safe but it will probably take a long time to air out. Whether earth or objects that are to be discarded, be very cautious in where you store contaminated materials and be sure they are labeled with warning signs so that someone won't accidentally become contaminated.

Rubberized equipment or other gear that won't be damaged by water can be cleaned by boiling in soapy water for two to eight hours, rinsed in clear water, then left to dry. A few words of caution are in order: The boiling water will contain dangerous chemical vapors.

For rifles, ammunition or other gear which would be damaged by soaking in boiling water, another method of decontamination is to use a 1 percent sodium hypochlorite solution (household bleach) to wipe off and neutralize the agent. Be sure to avoid getting any liquid in the gas mask filters when you decontaminate your gas mask.

Expendable contaminated objects can be burned in a very hot fire. Please note the word "hot." As in furnace. Just a grass fire or even burning down a contaminated house won't work. The dangerous chemi-

cals will condense out of the smoke and fall on the surrounding area. Burning is suitable only for small objects and, even then, stay upwind from the fumes of the fire to be on the safe side.

Persistent Agents—A persistent chemical agent is designed to make an area unsuitable for habitation for long periods of time. Such agents are generally easy to spot since they will be globules of sticky, oily goop designed to stick to foliage and personnel. Because the liquid that the chemicals are "packaged" in has a lower boiling point than that of non-persistent chemical weapons, it will take longer for the agent to evaporate into the air and become diluted.

Due to this oily packaging, persistent agents are harder to remove from an area and will take a long time to be degraded by mother nature. The worst of the persistent agents are the blister and nerve agents.

Decontamination of non-persistent agents is basically the same as for persistent ones, only the task is much easier and if you just leave it alone in warm weather, the agent will evaporate away in several days to a week's time.

To decontaminate an area where persistent agents have been delivered, you need to have a source of water with soap or detergent, as well as potent chemicals.

Strong alkalies are among the most effective chemicals used in decontamination. Some of the best are quite common: chlorinated lime, calcium oxide, sodium hydroxide (lye or caustic soda), sodium carbonate, and sodium hypochlorite (in bleach). A stroll down your local supermarket will allow you to obtain most of these. These alkalies will all greatly downgrade the danger of agents and will even neutralize most of them.

As mentioned before, in addition to neutralizing agents, the second prong of decontamination is to remove them from a surface or area. Organic solvents can be used for this. They lift agents off surfaces so that water can be used to wash the agent and solvent away. Organic solvents, too, are quite easy to obtain. They include: alcohol, kerosene, gasoline, and acetone. Be careful with these; they're all flammable.

The only catch with solvents is that they must be used in conjunction with a lot of running water and they do *not* neutralize an agent so that the runoff is dangerous.

The best decontamination procedures combine the alkaline and solvent into one clean-up procedure. One good combination for this job is soap or detergents and warm water (warm water works best) with some alkaline dissolved in it.

One of the best alkalines for this task is sodium hydroxide (lye or caustic soda). This mixture will neutralize a wide range of chemical weapons—a real plus since you won't often know what you've been attacked with. A good mixture of the sodium hydroxide solution is 5 pounds of

sodium hydroxide to 12 gallons of water.

Alkalines are dangerous in their own right. Be careful mixing the solution. Sodium hydroxide reacts violently with the water and should be added to water only a little at a time. If you spill some of the mix on yourself, it can be neutralized with vinegar or boric acid solution. It's a good idea to have one or the other handy for accidents. Do *not* use sodium hydroxide on aluminum, tin, or zinc. The alkaline mixture will "eat" into the metal.

Sodium carbonate (washing soda, sal soda, or laundry soda) can be used where sodium hydroxide isn't available or would damage materials. Sodium carbonate is a second choice since it isn't as active in chemical agent clean-up. Again, soap or detergent added to the sodium carbonate/water solution will help lift agents off surfaces. Sodium hypochlorite—straight from the bottle or mixed in water—is also good for neutralizing many chemical agents. The maximum dilution of sodium hypochlorite is probably ½ cup bleach per gallon of water. If the bleach is old, reduce the amount of water.

Some areas are easier to clean than others. Generally, the less porous a surface, the more easily it can be cleaned.

Gear packed in metal, glass or plastic air-tight containers will not be contaminated by chemical agents if you carefully decontaminate the outside of the containers before opening them. Material in open containers or in cardboard or paper containers, will be contaminated by agent contact. Borderline protection is offered by cellophane, foil or waxed boxes. Proper storage of survival gear and supplies will greatly improve your chances of decontaminating and using your survival stocks.

Generally, water contaminated by a chemical agent cannot be made safe to use. Boiling, distillation, etc., won't do the job. You *might* be able to place activated charcoal (2 pounds) and sodium carbonate (2 ounces) into the water (1 gallon), leave it for 20 minutes, and filter it through a cloth and then boil it for 20 minutes . . . but this is a whole lot of work and the end result is not too tasty. Best to find new sources of water if at all possible.

Suggested Reading—If you aren't familiar with how to protect yourself from biological or chemical weapons, get a book that addresses the subject. My book is one choice: *Chemical Biological Warfare Survival*, Long Publications, Box 163, Wamego, KS 66547, \$7. Or get a copy of the Army field manual, *FM 21-41 Soldier's Handbook*. These will give you the basic information you need to know.

Biological and chemical weapons may well be used in future wars. Those who know what to do can protect themselves from the dangers of these weapons just as they can from other weapons. A little know-how can greatly improve your survival chances if such weapons are ever used against you. ●

HERBAL MEDICINE

Continued from page 53

bine 8 ounces of Chickweed with 4 ounces of Comfrey leaves and add to 1 pint of oil. Prepare as described above in the section on SALVE. It is an excellent ointment for heat rash, diaper rash and other itches including those from poison ivy. But, remember the area must be cleaned before application of the ointment.

To prevent the itches and stings from insects use this herbal insect repellent. Mix 1/4 ounce each of the following herbs: penny royal, eucalyptus, calendula, lavender and aloe vera. Prepare following the section on TINCTURE. Rubbing alcohol may be used, instead of drinking alcohol, since this mixture will be applied to the skin. But, remember that rubbing alcohol is poison and should not be taken internally.

The seven simple herbs, and others, described in this article, may be gathered in the wild, cultivated in a garden, or purchased readily from supply lists. However, if purchasing herbs already grown you must be careful and ascertain that the herbs have been grown without the benefit of chemicals. Many third world countries use pesticides that are banned in the U.S., such as DDT. Herbs grown with the use of these chemicals would be hazardous to your health. So, when in doubt, grow your own, or deal with a reputable herb dealer.

Remember, herbal medicine is one other useful skill for you to learn. It is important in emergency situations to not be totally dependent on outside help. But, herbal medicine is not a substitute for qualified medical attention. If available, a physician should be consulted for serious medical conditions. ●

SUGGESTED READING

Growing and Using the Healing Herbs, by Gae and Shender Weis, available from Mothers Bookstore, P.O. Box 70, Hendersonville, N.C. 28793. This book gives cameos on approximately 80 different herbs including uses and cultivation. Later sections describe advanced herbal formulations. The best all-around book for a beginner.

The Way of Herbs, by Michael Tierra, available from Simon and Schuster mail order department—1230 Avenue of the Americas New York, New York 10020. This book assumes that you know very little about herbalism. Gives specific formulas and dosages.

The World of Herbs and Spices, by James McNair, available from Ortho Books, Consumer Products Division, 575 Market Street San Francisco, California 94105. Stresses propagation of herbs and integration into an urban garden. Color pictures help in identification of herbs but this book steers clear of medicinal uses.

Herb Buyers Guide, available from Herb Society of America, 300 Massachusetts Avenue, Boston, MA 02115. Lists a number of available herbal stores throughout the United States.



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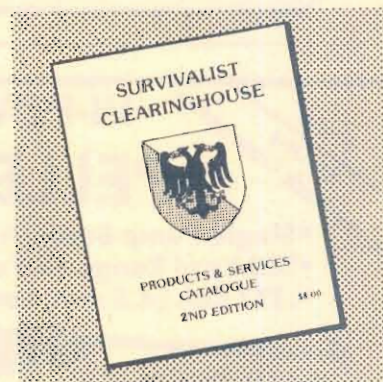


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CASCADE BLIZZARD

Continued from page 43

ing bow, Easton aluminum hunting arrows, razor sharp Savara broadheads, my spotting scope and binoculars.

I'd hunted and camped with this same equipment many times. From the Pasayten Wilderness to the wet rain forests of the Olympic Peninsula. Around Washington state I'd competed in many archery tournaments, and twice internationally. I can look up now and see the many trophies and medals on my walls. So why such an almost tragic ending? Mainly two glaring errors: clothing and weather knowledge.

For the two weeks prior to this trip, I'd been in touch with the people at the Glacier, Washington, Ranger Station. I knew them well from my many trips earlier in the summer and fall. Usually by evening they'd have the latest forecasts from the main station in Seattle. Those and extended forecasts had been very accurate. The extended forecast for the time of my trip was clear skies for the first two days and scattered flurries for the last four.

Storm—What happened to bring about this story was a storm that blew down from the Canadian side of the Cascades on day two and didn't let up for three days.

Lesson #1: Never put blind faith in extended forecasts, a thought not hard to remember when trying to pitch a dome tent on an almost treeless moraine in a 40 mph wind. Or when waking up to three feet of "scattered flurries" outside one's tent door in the morning.

Lesson #2: Always carry a small portable radio. Nowadays, manufacturers are producing them economically and in very small sizes, some no larger than a deck of playing cards. Remove the batteries and keep them in a pocket next to your skin along with your spare set. The colder the air, the less power there will be in your batteries. Install them only to listen to the radio, then return them to your warm pocket. Keeping the radio in a pocket next to one's skin is inviting trouble. Body moisture, i.e. perspiration, will find its way inside and freeze when you take it out and expose it to the cold.

Another solution is to use silver oxide batteries, reliable in cold weather, but very expensive. Forget the popular lithium batteries. Below 32 degrees F. most brands cease to function at all. Newer radios and batteries weigh next to nothing, I wish I'd had them.

My clothing was a whole 'nother story in that I made almost every mistake there is to be made. All my clothes were geared towards lowland brush and timber and the rolling hills of Eastern Washington. I thought all I'd need would be long underwear and a wind proof parka shell for high country snows. My socks, pants and sweaters were wool as was my Navy watch-

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cap. I had extra tube socks to keep my feet warm in my hiking boots and heavy mittens to go over my wool gloves. What I found out the hard way was that cotton long underwear and socks soak up sweat like so many sponges and stay wet. Once the skin is wet, it radiates heat at 10 times the rate of dry skin. Mittens over my wool gloves kept out neither the wind nor the wet. I was lucky I didn't lose any fingers or toes.

My wind parka was constructed of the popular 60/40 cloth. It fit well, not too snug, was water repellent, and looked rather jaunty to walk around town in. The major problem with it was that while it repelled water and falling snow very well, it did not breathe but trapped escaping body moisture, saturating my clothing from within. When it was finally wet all the way through, I started to chill and shiver so violently that I could hardly function. Stripping off wet parka, sweater, and cotton longjohn top in favor of a dry Damart turtleneck, and camouflage hunting jacket while exposed to a high altitude blizzard is something I don't ever want to do again. I was too cheap to spend the extra \$25 to \$40 and get a Gore-Tex parka. Frugality almost cost me my life.

Gore-Tex material repels both wind and water, yet still allows sweat molecules, pumped out by body heat, to escape directly through the membrane. Mitten shells made of Gore-Tex keep hands warm and dry and help prevent frostbite and lack of mobility due to extreme cold.

The wet clothes I'd taken off were neatly folded and frozen almost solid at my feet. My tent, though securely anchored, was sagging under the snow accumulating on it. I was worried about suffocation, so every half hour or so I'd shake the walls from inside and let the wind blow it away. I lay wrapped in my mummy bag blessing the salesman for recommending Polarguard over down. The bag was wet all the way through. Had it been goose down, it would have clumped up and shifted, creating a myriad of uninsulated cold spots. Had that happened, I'd have frozen to death.

My food supply, as I was later told, was well chosen. Mountain House freeze dried dinners require only hot water and 4 to 5 minutes to become absolutely delicious. International coffee for anytime, breakfast bars and Zwieback for breakfast, cheese, sausage and crackers for noon meals, my own special trail mix to keep my body fueled through the day. I'd planned on a six-day hunt. Two days into it and I'd already consumed four day's worth in my efforts to keep warm.

Sunrise—I awoke the next morning thinking it was still the dead of night. It

was dark and utterly quiet; whereupon I immediately panicked. Frantically I beat against the sides of my tent thinking that the snow had totally buried me. As soon as I did the accumulated snow fell away and my tent was flooded with light shining through it's fabric. The quiet was the quiet of a blown over storm. Poking my head outside, I was greeted by the most beautiful sunrise of my life. Beautiful mostly because I knew I'd survived the night to enjoy it.

After a hearty breakfast, I took stock of myself and my equipment. My tent was soaked but whole, no broken tent poles, the wind had not ripped any of the seams. My sleeping bag was still saturated as were all my clothes and jackets. My plumbers candles were burned to stubs, (all three of them), one canister of fuel remained for my Gaz Bluet stove. I had food remaining for only one more day on the mountain, possibly for the night as well. The thought made my skin crawl.

For myself, I was as rested as I could be, what with trying to stay awake so I wouldn't wind up frozen to death, a common mistake. I stank, having relieved myself in my clothes and sleeping bag rather than brave the blizzard raging outside during the night. My temperature was normal, body core heat having been retained in the night by my wool clothing, Polarguard sleeping bag, high energy trail mix and hot coffee. Using my signal mirror, I examined as well as I could my face and ears for signs of frostbite. Nothing. My full length ski mask had protected my face and head as only the area around my eyes was exposed.

The aftermath of the storm was a beautiful unbroken sheet of snow. Powder snow, the kind most skiers only dream about, holds a special terror for a man on foot. Especially when the man on foot happens to be yours truly and has neither snowshoes nor gaiters (ankle wraps made of nylon or Gore-Tex), to keep the snow out of his boots. Not to mention the 20 extra pounds of ice and water soaked into everything I had in my pack.

There was nothing else to do but pack up and get to it. After stowing everything in my pack, I tied my pants legs around my ankles with socks to try to keep out the snow. It didn't do any good. My boots were filled with snow before I'd gone 100 feet. In places the snow had drifted from three to six feet in depth. Gritting my teeth I pushed on. My Toyota was three miles away and 2,000 feet down, there was no way I would spend another night on that mountain.

Snowshoe hare and ptarmigan moved slowly out of my path or exploded out of the snow at my feet, a shotgunner's dream-

Continued on page 75

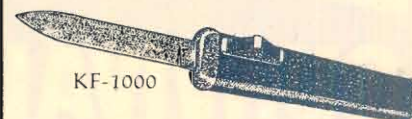
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PRESENTS

THE SWITCH-A-ROO KNIVES SWITCH-A-ROO I



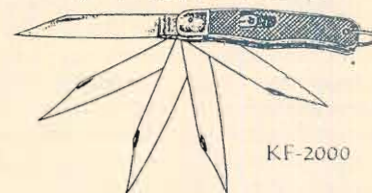
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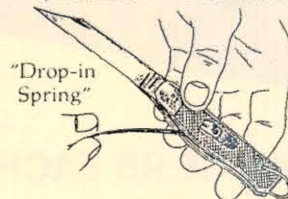
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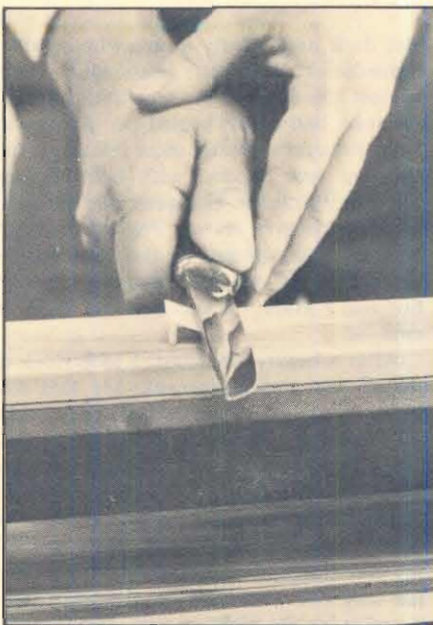
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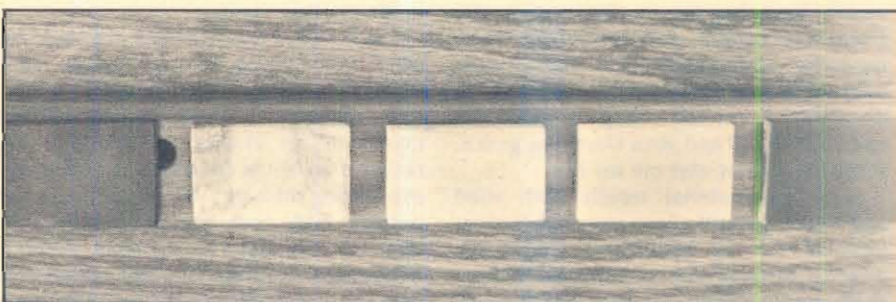
Continued from page 34



ABOVE—This microscopic photograph shows both sides of a knife edge finished with a Washita stone.

LEFT—When sharpening, hold the knife at a 23 degree angle to the sharpening stone. Use of a wedge approximating the angle is helpful.

BELOW—Five basic hones are from left, extra coarse silicon carbide, coarse Washita, fine Hard Arkansas, extra fine Surgical Arkansas, and super fine Black Arkansas. The middle three are most commonly used.



The coarsest is an ebony colored silicon carbide stone used for putting a rough edge on extremely dull blades. The others are natural stones, of which the softest is the grainy Washita, a marble-like stone with a purple hue. This material gives a preliminary edge that is usually finished with a grayish Hard Arkansas stone.

The Surgical Arkansas is a deluxe version of the Hard Arkansas. It does a similar job, but is a little harder to produce, and therefore more expensive. This is the stone preferred by anyone who needs a scalpel-like edge.

For even finer honing, you'll need a super fine Black Arkansas that can produce an edge so fine it's probably lost after only two or three cuts.

A Washita and a Hard Arkansas stone will do most jobs," advised Cannon. "For the survivalist, a trihone with a silicon carbide, Washita and Hard Arkansas might be advisable, as well as a Surgical Arkansas with a wooden base." He suggests that buyers carefully inspect each hone before purchasing. "Slowly draw a knife across the top of the stone. If this brings out any saw marks, the stone hasn't been lapped (smoothed) enough and will create uneven edges on your knife. Similarly, avoid stones with squared-off edges

that can damage the knife blade during sharpening. A rounded edge is preferable."

Size—The size is also important. "A stone should be at least as long as the blade of the knife to be sharpened," Cannon recommends. (Yep, those little pocket jobbies are meant for pocket, not butcher, knives.) "This allows the sharpener to put a uniform edge on the complete length of the blade."

Stones come in large, but not "economy" sizes. Because the material is extremely fragile, the cost of a hone multiplies in relation to its size. A 3-inch stone, for example, may run around \$2.50, while a laminated 8-inch one (two stones are glued together to give each other support) costs \$26 to \$27.

Fragility is another reason for the wooden and plastic boxes and/or bases that add to the cost of many sets. These both protect and support the stone. Since wood and plastic are less expensive than an extra thick stone, they also diminish the cost per unit.

According to Cannon, a 6- to 8-inch hone is large enough for most purposes. He has cut the meat off a complete moose using a presentation hunting knife (5-inch blade) and a pocket ceramic stick

sharpener. When he returned home, he remade the edge with a laminated Washita/Hard Arkansas stone.

Angle—When sharpening, hold most knives at a 23 degree angle to the stone. If the angle is too steep, you'll get such a feather edge that the steeple shape will easily bend or break. On a filleting knife, it may be possible to use a 20 degree angle—as long as you stick to cutting flesh.

Oil will both lubricate the cutting action and float away the microscopic metal particles that come off the knife. Although just about any fine oil will do the job, there are a number of commercially produced honing oils that provide both a mineral oil base and a rust inhibitor.

Just as useful, but less expensive, is liquid dish detergent. Squirt it on the stone. When you're finished, rinse both the stone and knife under hot running water.

Generously lubricate a new stone before use. It will absorb a fair amount of moisture.

Once there's a layer of lubricating oil on the stone, place the blade of the knife across one end. Move it in a gradual arc so that it cuts into the stone. Press hard enough that you can hear the knife cutting into the surface. Too little pressure will create a slight ringing noise.

If the blade is flexible (such as with a filleting knife) either put a second finger across the blade to hold it steady, or lift your hand slightly as you near the end of the stone. This will allow you to maintain the correct angle. On curved blades, raise your hand a little. Count each stroke. Make sure you use the same number (usually 10 to 20) on each side.

As you work, a grayish streak will appear on the stone's surface. Don't worry. The color is the microscopic metal particles that are being removed from the knife and will wash off along with the oil.

Start with the coarser stone. Although the stone you choose will change depending on the condition of your blade, in most cases, it's best to start with a Washita. When the knife's edge improves, move to a Hard Arkansas or Surgical Arkansas, depending on how fine you want that edge. Few people use a Black Arkansas unless they need a hunting knife with a razor-sharp edge that will dull after only a couple of cuts.

Finish off on a leather strop that will remove any little burrs and smooth down the rough spots. A leather knife case is ideal for this purpose.

Your ability to survive will depend on far more than your facility with a Washita stone. By planning ahead, however, and making sure you have the tools necessary for producing different qualities of edges, you'll be ready for many emergencies. ●

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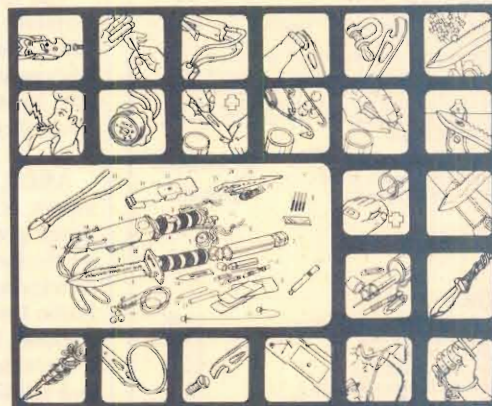
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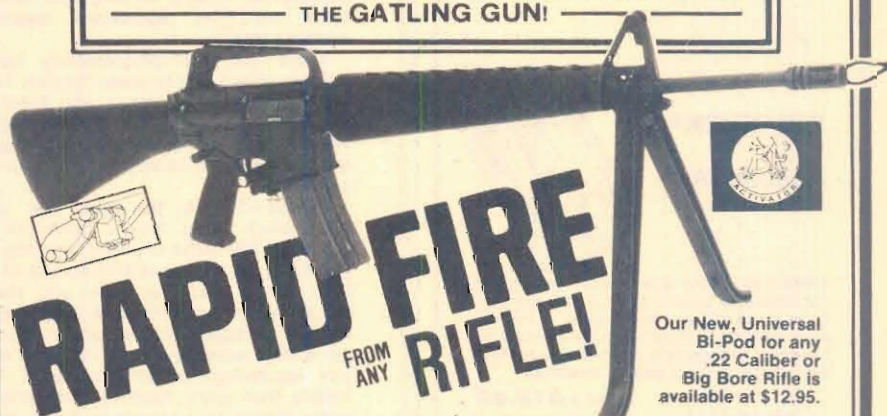
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HAM RADIO

Continued from page 55

of the hams he talked to were operating under similar field conditions, or worse. Most were envious of the luxurious van, as some operated out of tents in the rain.

The range and power of these radios is certainly a far cry from my CB. Among the 700+ contacts that they made during the 24-hour event was a call from a ham operator located in England, over 7,000 miles away! Try that with your CB sometime!

ARES, NTS—But Field Day is just one aspect of ARRL's contribution to emergency preparedness. They also have two public service groups dedicated to the task of relaying emergency messages, Amateur Radio Emergency Service (ARES), and the National Traffic System (NTS). ARES acts to provide local backup for disaster relief and public safety groups during disasters. NTS is a relay service, fielding routine and

emergency messages throughout the nation.

One ARRL publication describes NTS as a "pony express in the air." NTS serves not only as a message-handling service for hams, but for the public as well. By contacting your local ham club, anyone can send "ARRL Radiograms" for free. Short messages are relayed thru the NTS network until they reach their final destinations. My own experience with radiograms shows that, under normal conditions, I can send a message from coast-to-coast and receive a reply in 24 hours.

After the Houston area was hit by hurricane Alicia, the only way to reach relatives and friends was via these Radiograms. Phone service was cut off for a month in some areas. Under these conditions, expect radiograms to take a bit longer.

HOW TO BECOME A HAM

GETTING started in Amateur Radio is not simple as it is with CB. You can't just go down to a Radio Shack and pick up the gear, you must be licensed by the FCC.

License requirements are threefold. First, you must learn Morse Code. Second, you have to know a bit about radio and electronics. Finally, all amateurs have to learn the FCC regulations regarding Amateur Radio.

There are five progressively harder classes of amateur licenses: Novice, Technician, General, Advanced, and Extra. As you advance in grade, you obtain more privileges, such as more operating frequencies and greater variety of gear you can operate.

Novice—This is the level that most hams start off in. Novice operators are limited to 250 watts of power, sending CW (Morse) only, and have limited use of the ham bands. But the code and theory requirements are minimal. A Novice must be able to receive Morse code at 5 words per minute (wpm) and know the basic rules and regulations of amateur radio. This means that you'll have to learn enough radio theory to understand these rules. Don't let this scare you though, there are kids in every town that have their Novice licenses before they turn 14.

Technician—If you already have some knowledge of radio or electronics, this is the place to start. The code test is the same as for Novice (5 wpm), but you also have to pass the radio theory required for General class. This will earn you Novice privileges, and also permits you to operate "phone" on ham bands above 50 MHz.

General—This is the goal to shoot for. Most hams have General licenses. As with all other classes, you need to know the rules and regulations, but you have to learn more details about how to operate a radio station. This includes a better knowledge of radio theory as well as learning to receive code at 13 wpm. A General class license permits you to operate all types of

ham equipment on all bands at maximum power. There are a few sections of the ham bands that are reserved for the higher classes, but it's not a problem.

Advanced & Extra—Special frequencies are allotted Advanced and Extra class operators. These are all on the shortwave bands, allowing very long range communications. Since these sections of the ham bands are reserved for the select few, there is much less traffic, hence less interference. This permits Advanced and Extra-class hams to talk over greater distances than the lowly Generals can. Advanced-class requirements entail a code speed of 13 wpm and passing an intermediate-level radio theory exam.

Extra-class is definitely for the privileged few. It entails receiving CW at a whopping 20 wpm (I can't type that fast!), and an advanced level of knowledge of radio theory. This is equivalent of getting a First-Class FCC Radiotelephone ticket, what the technicians at radio and TV stations have, but they don't have to learn Morse!

Morse Code—This is the big stumbling block for most would-be hams. There would be far more hams on the air today if the Morse Code requirements were abolished. The FCC considered doing just that, but later decided it wasn't such a good idea. At first glance this sounds unfair, but there is a good chance that it would have turned ham radio into another CB, with jamming, profanity, and unlicensed transmitters abounding.

Morse is difficult but not impossible to learn. Every local ham club has their own "Elmer," a member who teaches beginners the elements of code and theory. Rather than "going it alone," your "Elmer" can really help out in learning code. Without the aid of someone saying, "You can do it," you may just give up.

So, go do it! Contact your local ham club through the Red Cross, Sheriff's Dept., or by writing the ARRL, Newington, CT 06111. What are you waiting for?

Acting in concert, NTS and ARES can set up anything from a local emergency relay net, to a national or even international radio network. ARES and NTS usually do not work directly with civil defense, but service other agencies, such as Red Cross and the Salvation Army.

The ARRL and Red Cross have a long-standing agreement concerning disasters. Hams provide the Red Cross with needed emergency communications capabilities. In fact, NTS serves the National Red Cross as its only emergency radio network. In return, the Red Cross provides meeting places for many local ham clubs. Some even have club-owned radio stations located in Red Cross buildings.

The Radio Amateur Civil Emergency Service (RACES) is the official link between ham radio and civil defense organizations. The FEMA-sponsored service acts as a backup for normal civil defense communications links. RACES members are licensed by both the FCC and local civil defense organizations. During an emergency, RACES members would form a network on normal ham bands for the sole purpose of providing CD officials with adequate communications. Most state CD headquarters have their own stations to link directly with RACES members.

In the event of a war, the only amateurs legally able to operate on ham frequencies would be RACES members. They would be authorized to communicate only with other RACES stations. All other hams would be ordered off the air by the Feds. (If you think that this is a joke, keep in mind that during WW II, ham radio was shut down completely. Illegal transmissions on any frequency brought about a prompt response from the FBI.)

MARS—Not to be outdone, the military has its own ham organization, the Military Affiliate Radio System (MARS), composed of hams from both military and civilian life. Like NTS, they relay messages through their international network of stations. There is not a military base, or ship at sea that does not have their own MARS station. They are well known for setting up holiday phone links between servicemen and their families back in the states.

Unlike other amateur services, MARS stations do not use normal ham frequencies. Instead, they use military frequencies located just outside the ham bands. They are also authorized to stay in service in wartime.

Each service has its own MARS network. The Air Force, for example, has 6 regional MARS headquarters in the U.S. Each of these will typically have about 200 affiliated civilian hams, as well as ham

Continued on page 71

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Portable Radiation Dose Rate Meter Evaluation

A nuclear firm finds this instrument is 'well built' and 'state of the art' . . .

Staff Report

A REPORT on the British Plessey PDRM 82 portable radiation dose rate meter by a nuclear testing firm finds that the unit is a well built, state-of-the-art instrument.

This magazine had the PDRM 82 evaluated by Jordan Nuclear Company of Los Angeles at the request of the exclusive U.S. distributor of the PDRM 82, Guillory & Associates, P.O. Box 591184, Houston, TX 77259-1184; (713) 480-9760.

In the company's report of its evaluation of the meter, it is stated that the PDRM 82 "is a well designed and well built instrument, simple in appearance and use, which is important keeping in mind the intended purpose of same. Its electronics and mechanical layout reflect the state of the art."

Particularly liked by the evaluator, the report says, is "the battery cover-switch combination. The slim-line look, and metering placed on top are reminiscent of some of the" civil defense equipment "instrumentation of long ago, and is purposeful still, yet lighter, smaller."

The PDRM 82 is being purchased by the British government for use by its military and civil defense personnel. The unit is designed to withstand the shock of a nuclear blast, electromagnetic pulse (EMP) and nuclear contamination while continuing to function for up to 400 hours on a set of three C batteries.

The PDRM 82 and PDRM 82F—the same unit with a five-meter cable attached to a remote sensing head for measuring gamma radiation from inside a shelter—are now available in the U.S. from Guillory & Associates. The PDRM 82 sells for \$375 and the PDRM 82F costs \$450. Discounts of \$100 per unit apply when 10 or more are purchased. For an additional \$30 the bright orange reinforced hard plastic case can be bonded with olive drab or camouflage epoxy resin.

Guillory is now marketing these dose rate meters with instructions for use and an explanation of parts attached to each unit.

The meter's liquid crystal display shows

radiation dose rate readings from .1 to 300 centigrays (rads) per hour in air. The meter is automatically self testing, showing that it is operating correctly, and indicates via small arrows at the extreme left of the display whether the dose rate is rising, falling or static.

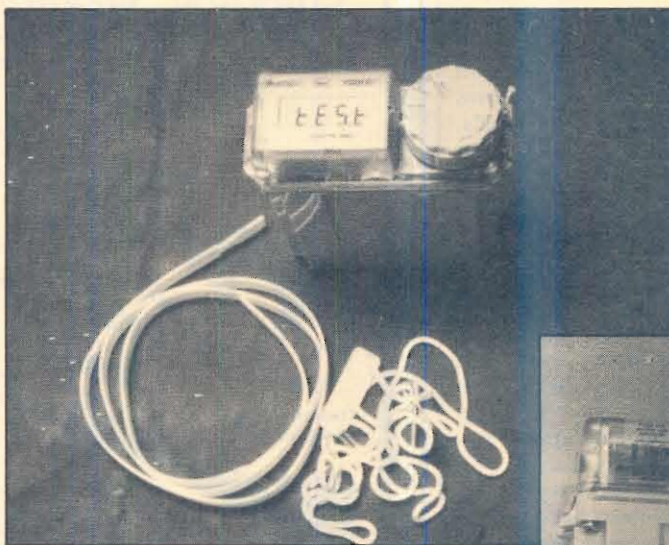
Jordan Nuclear Company found the range of the PDRM 82 "satisfactory" but concluded that it "falls short of the generally accepted 'fatal-dose' limit of 500 rads per hour. At 1,500 rads per hour it still indicates by flashing 300 rads."

The company's report also questioned "at what levels of increased radiation

beyond the PDRM 82's limit of 300 rads will it no longer indicate radiation or indicate zero on the scale when the actual dose may be extreme."

Testing was not done on how much shock and vibration the hard plastic case of the unit will take before being damaged to where the interior would be damaged and contaminated and the unit would no longer be waterproof.

All things considered, the company found the PDRM 82 to be well made and accurate within its stated limits. For more information or ordering, contact Guillory & Associates. ●



ABOVE—The PDRM 82 comes with a neck strap and lanyard.

RIGHT—Printed explanations of the meter's functions and operating instructions are attached to each unit.



Personal Protection System

Continued from page 51

fired back.

"Placing a lot of emphasis on using 'sight pictures' in combat training is not only pointless because of the close range, probable darkness, and time lost in lining them up, but because tunnel vision also makes it almost impossible to *focus* on the front post to begin with.

"Aimed fire at targets means focusing your vision on the sights," McSweeney contends. "The sights come in sharply, while the target itself blurs. You cannot *possibly* focus on both unless they are almost touching; try it yourself. This focusing process is done with the conscious mind, but under threat of instant death at close range, the conscious mind shuts down altogether. The subconscious mind takes over along with the central nervous system; this most-primitive part of your being wants to *survive* at all costs, and it can't trust the conscious mind to do anything right, so it takes over. So, unless you've trained your motor nerves in the correct methods of spontaneous response or "reflex action" which the subconscious and neural system will accept, they may not perform properly and you may very well die.

"The most effective method of training anyone in combat shooting," concludes McSweeney, "is by *instinctive pointing*. In this method you concentrate on the target, not on the sights. It's what you'll do regardless of whether you want to or not. With instinctive shooting, you're 'going with the flow' of the Tachy-Psyche and related effects, instead of fighting these effects as the current crop of aimed-fire handgun shooters do. And your hit rate will jump astronomically at realistic ranges, even in the dark."

Instinctive Point Shooting—At McSweeney's Self-Defense Unlimited, trainees are first required to become familiar with three basic principles of combat handgunning:

1) **FORGET THE GUN HAS SIGHTS!** Sights, claim John McSweeney, are for field weapons like rifles, not handguns which are designed for combat at seven yards or less! "For purposes of learning to defend your life," he warns, "you should concentrate on training within the seven-yard line. Start extremely close—at three yards—then work out to five or seven yards." Beyond close combat range, McSweeney suggests using weapons designed for intermediate and long range shooting; shotguns, submachine guns, and assault rifles.

2) **DON'T SQUEEZE THE TRIGGER!** Instead, trainees learn to **PULL** the trigger **RAPIDLY**, without jerking.

3) **DO NOT FULLY EXTEND THE**

Continued on page 72

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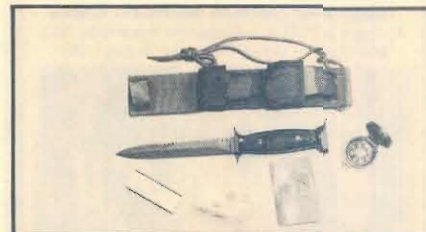
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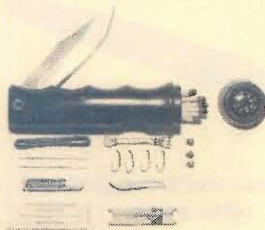
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THE GREENHOUSE EFFECT

Continued from page 27

ing from the end of one of these interglacial periods. Since these climatic upheavals take place on geologic timescales, they are at the same time easier to predict in the long term (thousands of years), while still being subject to drastic variation in the short term. Thus a warming trend produced by the greenhouse effect can substantially raise temperatures over a period of tens or hundreds of years, while doing so in the midst of a long term (tens of thousands of years) cooling trend. The two theories are not incompatible with each other when viewed with reference to the time frames in which they occur.

We are indeed heading for an ice age, but that ice will take 30,000 or so years to get here. The warming caused by the greenhouse effect is with us now, and is of immediate concern in the decades to come.

Effects Of Warming—"It is increasingly evident that the intelligence community must understand the magnitude of international threats which occur as a function of climatic change. These methodologies are necessary to forewarn us of the economic and political collapse of nations caused by a world-wide failure in food production. In addition, methodologies are also necessary to project and assess a nation's propensity to initiate militarily large-scale migrations of their people as has been the case for the last 4,000 years . . . The politics of food will become the central issue of every government."—CIA report on Climate Change 1974

In attempting to determine the impact on agriculture of the greenhouse effect there are two widely used methods of analysis which can be of help.

The first is the comparison, using geologic records, of the climates and weather patterns on the earth during periods of warmth which roughly correspond to the level of warming predicted for the greenhouse effect.

The second method, available to scientists only in the past few years, is one of computer modeling of the atmosphere under the conditions which would be prevalent in a greenhouse affected world. Practical computer climate modeling has only recently become available with the advent of supercomputers capable of solving the billions of equations necessary for the creation of an accurate atmospheric model.

Using these two systems climatologists have begun piecing together the effects of a warming trend produced as a result of a greenhouse effect. Analysis using the two separate methods has yielded very similar results, giving climatologists a high degree of confidence in their predictions. These predictions are summarized below.

1—A rise in worldwide average temperatures of between 2 to 5 degrees Celsius, (3 to 10 degrees Fahrenheit).

2—A lower rise in temperatures in the equatorial regions with the rise becoming more pronounced moving north and south from the equator.

3—A shift in worldwide rainfall patterns with less rainfall in the U.S. and Canadian grain belts. Less rainfall is also likely in the current grain producing regions of the Soviet Union. Increasing rainfall is probable in India and north and east Africa.

4—A larger rise in temperatures over those areas predicted to have less rain, with a lesser rise in temperature for those areas likely to have an increase in rainfall.

Agricultural Effects Predictions:

1—North and East Africa, currently drought stricken, could in the long term become grain producing and possibly even exporting regions.

2—India will probably be able to harvest another rice crop each year, increasing overall food production. Like north and east Africa this is possible in the long term and only if sufficient financial and technical resources are invested.

3—Soviet Union can expect an increase in the growing season of the central plains region of up to two weeks. This will not necessarily result in an increase in production since the lack of readily available water for irrigation will remain or worsen. Also the Soviet economy has proven quite incapable even under present conditions of producing enough food to feed itself.

4—United Kingdom. A return to the climate that was prevalent during the Middle Ages, with a subsequent increase in agricultural output and export.

5—United States and Canada. A warmer climate with less rainfall will reduce yield in the grain belt. Agriculture relying primarily on irrigation, mainly in the west and southwest U.S. might have to be abandoned entirely due to an insufficiency of water for irrigation. While the agricultural production of this area involves only 12 percent of the nation's farms, it accounts for 40 percent of the value of all crops produced in the U.S. This area could be one of the hardest hit in the entire world by the warming of the greenhouse effect.

It should be noted that the U.S. itself, even in the worst case scenarios, will not face a future of being unable to feed its people. America will continue to produce enough food to feed herself. What can be expected is a reduction of the surplus agricultural commodities produced by the U.S. that much of the world depends upon.

It cannot be assumed that those regions which benefit from the greenhouse warming will be able to compensate for the loss

of the U.S. surplus. The areas which would benefit from a warming are generally in third world countries which have neither the knowledge nor the technical capacity to increase food production even if the growing conditions improve. As a practical matter the decrease in U.S. production will not be offset by an increase in production of the third world countries for a very long time, if at all.

International Implications—"Food is a weapon and we should use it." So spoke Daniel P. Moynihan (Senator from NY), just prior to his confirmation as U.S. Ambassador to the UN in 1975.

We have used it. In 1972 the U.S. refused to sell grain, even on a cash basis, to the Marxist regime of Salvador Allende in Chile. This refusal contributed to the instability and eventual overthrow of that regime. At the very same time as the U.S. was deciding not to sell grain to Marxist Chile, another decision was reached to sell nearly one quarter of the entire 1972 U.S. wheat crop to the Soviet Union. In 1972 detente was the policy of relations between the Soviet Union and the U.S. The Soviets made it quite clear to the U.S. that the continuation of detente was in part contingent upon U.S. willingness to sell large quantities of grain to the Soviet Union. As a result of the sale of such a major portion of the U.S. wheat crop to the Soviets, world and U.S. food prices increased. Third world nations saw many of their people go hungry when they were unable to pay the inflated prices of the world grain market. Meanwhile the U.S. did get a continuation of detente with the Soviets, at least until the policy fell apart in the mid 1970s.

As the effects of the greenhouse warming begin to be felt, we can anticipate that food will come to play an ever more vital role in relations between nations.

As food production lessens and worldwide surpluses decline, the power of the food producing nations will increase. It is also likely that resentment against those countries by food dependent nations will rise. A CIA report addresses this problem: "... the rural masses may become less docile in the future and if famine also threatens cities and reduces the living standards of the middle classes, it could lead to social and political upheavals which cripple governmental authority. The beleaguered governments could become more difficult to deal with on international issues either because of a collapse in ability to meet commitments or through greatly heightened nationalism and aggressiveness."

Of the almost 200 countries in the world, just 7 are net food exporters. Of those 7, the U.S. accounts for 90 percent

of the total exports of food. It is easy to see how the U.S. could become the scapegoat and target of the food-dependent countries.

Climate modification efforts by countries attempting to increase their food production, or even more ominously, to decrease production in exporting nations, are also considered possible threats by U.S. intelligence analysts.

From a CIA report, "The potential for international conflict due to controlled climate modification can be a reality (starting) in the 1970's . . . The Agency (CIA) will be faced with tracing and anticipating climate modification undertaken by a country to relieve its own situation at the detriment of the U.S." Not mentioned in the report is what the U.S. could or should do if such efforts are detected.

That such climate modification techniques exist is recognized by both the U.S. and the Soviet Union. In August 1975 at a meeting between representatives of the two countries, a joint draft treaty on environmental modification was presented to the Geneva Disarmament Conference. The treaty prohibits either side from pursuing programs which will purposely damage the other side by an alteration of normal climate. As before however, the question remains as to what could be done if such efforts were undertaken. Also left unaddressed is the question of a renegade nation such as Libya undertaking such efforts.

Conclusion—The long-term effects of the greenhouse warming are often cited in doomsday scenarios. Melted ice caps and flooded cities are indeed spectacular images of destruction. These events, however, do not happen overnight. Cities on threatened coasts will have centuries before they are flooded. Technology is already being invented which can deal effectively with storm surges and rising seas. Indeed it may be that the long-term effects of global warming are the easiest to deal with.

Far more unclear is how we deal with the current and near future problems caused by a climate change. Hungry people are not logical and we cannot presume that hungry nations, some with a begging bowl in one hand and an atomic arsenal in the other, will behave any more logically than will starving individuals. Desperate circumstances often inspire desperate (and futile) actions. We must be aware of and guard against the threat posed by such actions.

We have the advantage of knowing that the greenhouse effect is occurring. We can best deal with it through a combination of vigilance, common sense food policy, technology, and perhaps most important of all, humanity. ●

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SEVEN LEVELS OF SELF SUFFICIENCY

Continued from page 30

osophical change that you cannot store much more and that you're going to have to learn how to create things from the very beginning.

Level VII

The full blown country homestead looks just like a farm and acts just like a farm but is in fact a well stocked, well constructed fortress with a heavy commitment to staying through the worst trauma, plus a heavily constructed vehicle and 30 days of food and supplies available to be packed into it, along with a full evacuation plan to some already chosen distant site.

Even at this high level of preparedness, though, a calamity, such as a forest fire, could destroy all of this, and so you've got to maintain the flexibility and food reserves that go mobile.

Unfortunately the full-blown country home is what everyone thinks they should start out with! Just drop \$100,000 or \$200,000 into an already nice home in the country with five or so acres and a nice plot and everything will suddenly be all right! But nothing could be further from reality, because you cannot buy your way into a strong frame of mind—you only can buy hardware. Unfortunately, the difference between an unprepared person and a Level VII person is one of attitude and understanding, not just hardware.

A philosophical change makes them into survivors even if they don't have the hardware. It turns them into the kind of people who could go out into the woods with an axe, some food in a backpack and a good hunting rifle and probably build a log cabin and stock it for the winter, not living with much comfort but, nevertheless, living.

In fact, it's almost impossible to write down what Level VII requires in the way of hardware because, by then, it has become such a personal decision. All of the smaller risks have been covered in the other levels of preparedness, so the person developing the "ultimate" shelter is now working on those things he considers to be his own personal high-risk items.

What It All Costs

Level I's requirements for energy and money are really fairly minor. \$750 and a few hours of effort are all it takes to put together a basic week of self sufficiency. Of that \$750, \$450 is for a suitable firearm.

Level II requires the expenditure of another \$3,000 or so, but still with a fairly minor commitment to time and energy. The storage requirements are fairly simple, so they're very practical for the city dweller. The expenses divide out approximately evenly between food, sanitation and heat, and hard currency reserves.

Level III requires far more of a change

of attitude and energy, in addition to \$5,000 and a suburban, rather than a city home. Philosophically, you have to deal with the risks of living within a major city and decide to move. The \$5,000 expense is divided fairly evenly between additional food, additional firearms, communications equipment and additional hard currency.

Level IV doesn't have a very large monetary requirement, other than the money required to physically move, but leaving the city and moving to the country does require a total change in lifestyles, and so the emotional requirement is large.

Level V requires even more attitude adjustment. Suddenly you can't call a plumber or electrician every time something needs to be done around the homestead. You finally become aware that help may not always be available, and that you need to learn now to do everything now while there's still help and equipment easily available to you.

Level VI is where the money starts to flow a little more than most people like, for while you can produce the rest of the stored food for another \$3,000 or \$4,000, a totally independent water supply can be quite expensive, along with storage tanks and several years of fuel for a generator, extra clothing, duplicate tools, larger-scale fallout shelters and extras of everything for anyone coming to visit. But \$25,000 and a couple of years of effort will produce that level of preparedness, and having \$3,000 or more of pre-1965 silver coins and gold bullion will provide enough financial security to see you and yours through almost any threat.

Level VII is where you find that there really is no limit to how much money, time and energy can be spent! Homes costing over half a million dollars are not unusual, but perhaps the biggest problem with being at Level VII is that it becomes common knowledge in the area that you are well prepared. One can hardly build a \$500,000 home in an area where a \$100,000 home is considered large and still hope that local people won't know that the house is being built!

So some Level VII preparations are self-defeating because they invite so much attention that the preparations have to be made more forcefully. This, then, is where the law of diminishing returns becomes obvious; there is a place where another \$100,000 spent produces no real improvement in personal security. Heads of state are still assassinated even though hundreds of millions of dollars are spent protecting them!

While there is no perfect system, there is one sure thing—being unprotected against disruption is the worst condition you can expose your family to. Every little thing you can do helps. ●

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HAM RADIO

Continued from page 65

shacks on every military base. Each region handles around 1,500 messages in a normal day. But if war erupts or a natural disaster strikes, MARS is ready.

MARS played an important role in the aftermath of hurricane Camille, which struck the Mississippi coast with 190 mph winds on August 17, 1969. As the hurricane traveled inland, it left a gigantic wake of destruction. Phone and power lines were tossed around like match sticks, causing blackouts in most of the state. Radio and TV transmitting fared no better.

Amateur radio club station K5TYP, at Kessler AFB near Biloxi, Mississippi, was first to go on the air. The station, a part of the Air Force's MARS network, had a few difficulties though . . . their 70-foot antenna tower had been flattened by the storm. Eight of the club members, all servicemen, soon erected an emergency antenna. They started up the club's emergency generator and began what became a week of hard work.

K5TYP was soon in touch with military, Red Cross, Civil Defense and the National Weather Service. They quickly became communications HQ for the entire disaster relief effort. K5TYP even guided the first relief planes onto the runway!

Both NTS and MARS networks handled emergency traffic in subsequent days and many other hams came out of the woodwork to lend a hand. For 10 days following the storm, these men and women provided the necessary link to the outside world. Even after normal communications systems came back on line, their role wasn't over. Hams then handled lower priority health & welfare messages. If you had relatives living in that area, probably the first word of them was courtesy of hams.

The world of amateur radio encompasses far more than emergency response. Many major advances in radio communications have been brought about by hams. Amateurs are forever experimenting with electronics; achieving such esoteric forms of communication as bouncing their signals off the moon, and even off ionized trails left by meteors. They even have their own satellites launched by NASA aboard rockets, the "Oscar" series satellites have achieved remarkable success. Astronaut Owen Garriot, in orbit aboard the Space Shuttle, talked to hams by using a small 2-watt FM handie-talkie.

Currently, the big push in amateur radio is in the field of computers. Hams are constantly dreaming up new ways to use their rigs with home computers. Some use their computer as a fancy radio-teletype terminal, others to aim their beam antennas or just to keep their radio log. The future for hams may involve sophisticated computer technology, but who knows where it will go from there? ●

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Personal Protection System

Continued from page 67

ARM WHEN FIRING AND DON'T LOCK EITHER ELBOW OR WRIST. The arm should be bent at the elbow to minimize tension and the wrist should be free to move to afford flexibility in target selection. Once the Tachy-Psyche Effect sets in, the rush of adrenalin and pulsations within the Central Nervous System will cause a fully extended shooting arm to quiver and shake; this will lead to jerking of the trigger, resulting in missed shots at close range.

"The current method of two-handed combat firing is a half-way measure," McSweeney contends, "developed by bullseye shooters who were unable to control one-handed double-action firing with the shooting arm fully extended. They therefore compensated by bringing both feet in line to enable them to support the firing hand with the other one, thus minimizing their shaking. This results in a posture riddled with flaws.

The body is full-facing the assailant, offering maximum target area for return fire. Tension also still exists in the fully extended firing arm, which is also amplified by the need to stretch the shoulder

muscles in order to center the weapon in front of the chin. And worst of all," he concludes, "these methods are slow, fatally slow. In the time it takes to center the weapon, grasp the firing hand with the support hand, and then pull the trigger, you are already dead!"

To overcome some of these problems, McSweeney has devised a method of handgun training which is somewhat unique. To begin with, McSweeney drills his students in firing from the "boxers stance," which presents a smaller target to return fire than either the straddle-trench or Weaver-type stances. A one-handed grip with a bent elbow and flexible wrist is a "must," according to McSweeney.

"My method can even be used without modification in tight quarters, such as inside an auto or taxi, where a two-handed grip would prove difficult. Moreover, a two-handed grip is awkward when firing to either side and requires foot repositioning to fire to the rear. In the "boxers stance" using a one-handed grip, you can fire to any point in a 360 degree circle without having to change your stance; you merely pivot from the waist. Many of my students

have had previous training in IPSC methods, but after they try my method they quickly realize how limited IPSC really is. All it's good for," McSweeney continues, "is semidirectional shooting to the front at targets that don't shoot back. And it seems to overlook the obvious: rifles were designed to be fired with two hands, while the handgun was designed to be fired with one hand!"

Unlike many advocates of the "modern pistolcraft" who rely on the competition format for combat training, John McSweeney emphasizes repetitive drill in the basics of instinct shooting at Self-Defense Unlimited.

"To overcome jerked, missed shots," he explains, "I teach a rapid trigger pull from a strong one-handed grip, and through high repetition of moves, train the motor nerves to react automatically. Eyes concentrate on the target, not the sights, however dim the light may be. I train students to fire to the front, the sides, and a full 180 degree swing to the rear. I begin their training with Rabaser pistols in the studio, followed by live firing on an indoor range.

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a .38 Special revolver as the best all-around defensive handgun for men and women, although I do like the Colt .45 semi-auto for its reliability, stopping power, and ease of reloading. Magnums such as the .357 and .44 are altogether impractical as defensive weapons; the muzzle flash will blind you at night, the blast will deafen you in closed areas like bedrooms or hallways, and their recoil is excessive, which slows recovery time when confronting multiple assailants."

After careful training in the basics of instinctive shooting, McSweeney's students learn simple dry and live fire drills that they can use on their own to hone their handgunning skills. One of the most important of these drills is one involving dry fire in front of a mirror; by using one's own reflection as a target, one can learn to swing the gun from side to side while pulling the trigger reflexively the instant the muzzle is on line with the target.

Eye concentration, says McSweeney, is the key. Adjustments of windage and altitude can be made in the mirror until the trainee can instinctively drop the hammer the very moment that the muzzle points to the target center.

In both live and dry firing drills, practice should *never* be conducted from ranges greater than seven yards. Once a trainee can place rounds within an eight-inch center of the target from seven yards, multiple silhouettes can be placed side by side so that the student can practice moving from target to target, thereby developing a coordinated trigger pull and muzzle alignment so crucial in multiple attacker situations.

Once the trainee has gained proficiency in McSweeney's instinctive shooting methods, he is allowed to go onto the next stage; drawing the weapon and firing instantly from the "boxers stance." At this point, the student who has followed McSweeney's advice through diligent practice is now prepared to deal with 90 percent of all conceivable close quarters shootout scenarios.

"Unlike many of today's handgun experts," says John McSweeney, summing up, "my teaching method is geared towards the *average* man or woman seeking realistic self-defense skills. My techniques are not based upon a premise that is conducive to match competition; close combat is not, and has never been, any sort of game! Winners live, losers die; that's the real premise of close quarters handgunning!"

For more information about McSweeney's Self-Defense Unlimited or for video tapes of his armed and unarmed self-defense courses, contact: McSweeney's Self Defense, P.O. Box 1218, North Riverside, IL 60546. ☐



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CASCADE BLIZZARD

Continued from page 61

land. Had the weather turned bad again, I would have shot a few of each for food just in case. I had Judo points, (small game points), for my Converta-Point arrows and a special sight pin for close range shooting with them on my bow.

My main worry now, other than food, was twisting or breaking an ankle in a snow covered crevice in the rocks. I finally strapped my bow atop my pack and using my hiking staff and a sturdy branch, felt ahead of myself and hobbled my way down the mountain. Snow was melting in my boots and my feet were starting to numb. The exertion of my descent pumped new sweat into my clothing as it had the day before. I pushed myself at as fast a pace as I dared, knowing that a broken ankle or leg could prove fatal.

Six hours later I arrived soaked and exhausted at my car. Dumping my pack on the ground, I reached into my right rear pocket where I habitually keep my keys. My heart froze for a moment because my pocket was empty. In those days I carried a hide-a-key under my front bumper, it was there in its usual place. Without it, it would have been a long 15 or so miles walk to the ranger station at Glacier.

As soon as the heater was going full blast, I tried removing my boots from my swollen feet. The pain grew with every loosened bend of boot lace so I laced them back up and headed down the mountain.

Inbound to my hunting area I'd stopped and filled out a "trip registration" form. Requested data on this sheet included time and date in, expected return date, equipment and clothing carried, what kind of survival and emergency gear I had, probable location of campsite, how much food I'd packed, license number and description of vehicle, etc. This is an excellent system as it alerts the rangers immediately if someone is overdue or under equipped.

On the way in I'd filled one out. On the way out they were waiting for me with full medical kits. They'd expected I'd be in soon as I wasn't well enough equipped for the weather that had hit.

I'm not ashamed of my bloodless face and silent screams as they pried my boots off, I was alive to feel it. A lukewarm foot bath returned warmth and normal color to my feet after an hour or so. Wrapped in loose ace bandages and wearing a borrowed pair of dry wool socks (luxury!), I hobbled back to my car and drove 30 more miles to Bellingham and the nearest hospital. The air station hospital was only 40 more miles away but the pain in my feet would not allow the delay.

The medical diagnosis of my condition was exposure and "thermal injury" to my feet halfway to my knees. An \$11.95 pair of nylon gaiters would have prevented that by keeping the snow out of my boots. Not a

large price to pay, considering the pain and possible loss of toes it would have saved me. The staff in the emergency room marveled that my injuries were no worse. I was marveling that I was still alive and in one piece.

That was the end of my hunting season

that year. Six months later I was back on sea duty baking in the 130-degree Indian Ocean sun on the flight deck of the U.S.S. Kittyhawk. I've never forgotten the lessons I learned that trip, nor the beauty of that high and desolate place. I know that I'll be back there again. Someday. ●



Avalanches caused by unstable snow are one of the chief dangers after a blizzard.



The Mazama Dome area the morning after the storm. The Peak of Mt. Baker is visible above the treetops at right.



The author's oak hiking staff and pack, with bow lashed to the top, at a rest stop before reaching his vehicle and safety.

Gaiters

They've been around, in one form or another, for generations . . .

By Edward Brown

BECAUSE IT'S tough, lightweight, and functional, most of the clothing and equipment once used only by mountaineers is now in general use among outdoor folk and survivalists. There is, however, one excellent piece of gear which has been largely overlooked.

The equipment in question is gaiters (as opposed to gators). If you remember your *Lady Chatterly's Lover*, these were the first items of dress Gamekeeper Mellors had to get out of before he and the lady of the manor made beautiful music together.

Gaiters in one form or another have been around for generations: English poachers and grouse shooting squires alike wore them, mounted cavalry often had leather ones, and World War I Doughboys used a kind of cloth gaiter known as a puttee.

Gaiters, whatever their size, shape, or material, serve one purpose: protection, be it from snow, wet, the cold, sand, pebbles, scree, or the chafing from an animal's back.

The basic gaiter, designed to shut out snow or puckerbrush, is a cotton canvas or coated nylon affair, with a hook in front to snag a bootlace and prevent it from riding up. It has a long zipper in back, and something to keep it tight at the top. Some of the deluxe models are made of breathable Gore-Tex, and have a set of snaps on the rear overlap for added protection.

The military abandoned gaiters (they called them leggings) only after the jump-type boot replaced the old field shoe, or "Boondocker." The GI legging was made of stiff cotton webbing, and it went all the way up to the knee with lacing on the outside. For years after leggings had gone the way of the Dodo they were still being worn by Navy recruits and Shore Patrol heavies.

The Marines, arse-end Charlies when it comes to getting choice new gear from the DOD, kept leggings as part of their field uniform until well into the 1950s. They went to Korea in them, and the North Koreans soon learned to keep their distance from the Americans of the First Marine Division "with the yellow legs."

Probably the last gaiters in general issue were the ski type, an OD short gaiter with the inevitable lacing up the side. There are

still some of these around on the surplus market, and since they fetch only a song, are well worth picking up for a rainy day.

Lightweight Protection—The advantage of gaiters is that they give the trekker the protection of a knee high boot with none of the discomfort or weight of an envelope of leather rising up to the knee. They're a lot easier to get into and out of, and if they get too warm, all the wearer has to do is unzip and stock the gaiters in his pack.

Probably the best general use gaiters are the combination coated nylon bottom and Gore-Tex upper gaiters. A set from Recreational Equipment Incorporated (REI), of Seattle, Washington, used for field evaluation, is a good example of the breed. The gaiter is a full 16 inches high, and of this 16 inches, 12 are of Gore-Tex, the new miracle fabric which breathes with the wearer, yet shuts out wet from the outside. The bottom is waterproof taffeta nylon, with an adjustable neoprene strap to go under the instep. Heavy duty brass snaps go up the side and anchor the zipper flap down.

These are great for snow and wet, and will also add a few degrees of warmth to the lower leg. It's also possible, though by no means a sure thing, that gaiters such as the REI set would be some kind of protection against the strike of a rattler, though leather "snake proof" gaiters would be a much better bet in heavy snake country.

A step up from the unlined Gore-Tex gaiter is the expeditionary type, for extreme temperatures and high peak winds. Many of these gaiters cover the entire boot, and crampons go on over them. They are also usually insulated with something like Thinsulate all the way to the knee.

The woods walker making his way through low brush like crowberry or huckleberry, or even bull briars, will find he's glad he brought gaiters along. They can prevent the lower legs from taking a beating in thickets. This writer has noted bush-savvy Special Forces troopers wearing gaiters in heavy brush: unauthorized, but maybe they should be.

Gaiters even come into play in warm weather. The low type which reach just

over the top of a regular six-inch hiking boot will keep small stones and pebbles from working their annoying way down into the socks. There's no problem about wearing them with hiking shorts.

Having gaiters along on a backcountry trek allows for any number of expedient uses as well. If you've got the coated or Gore-Tex sort, you can fold gaiters to form a wash basin, fashion a rainproof hat, or use as gauntlets to protect the forearms. ●

A WORD ABOUT GORE-TEX

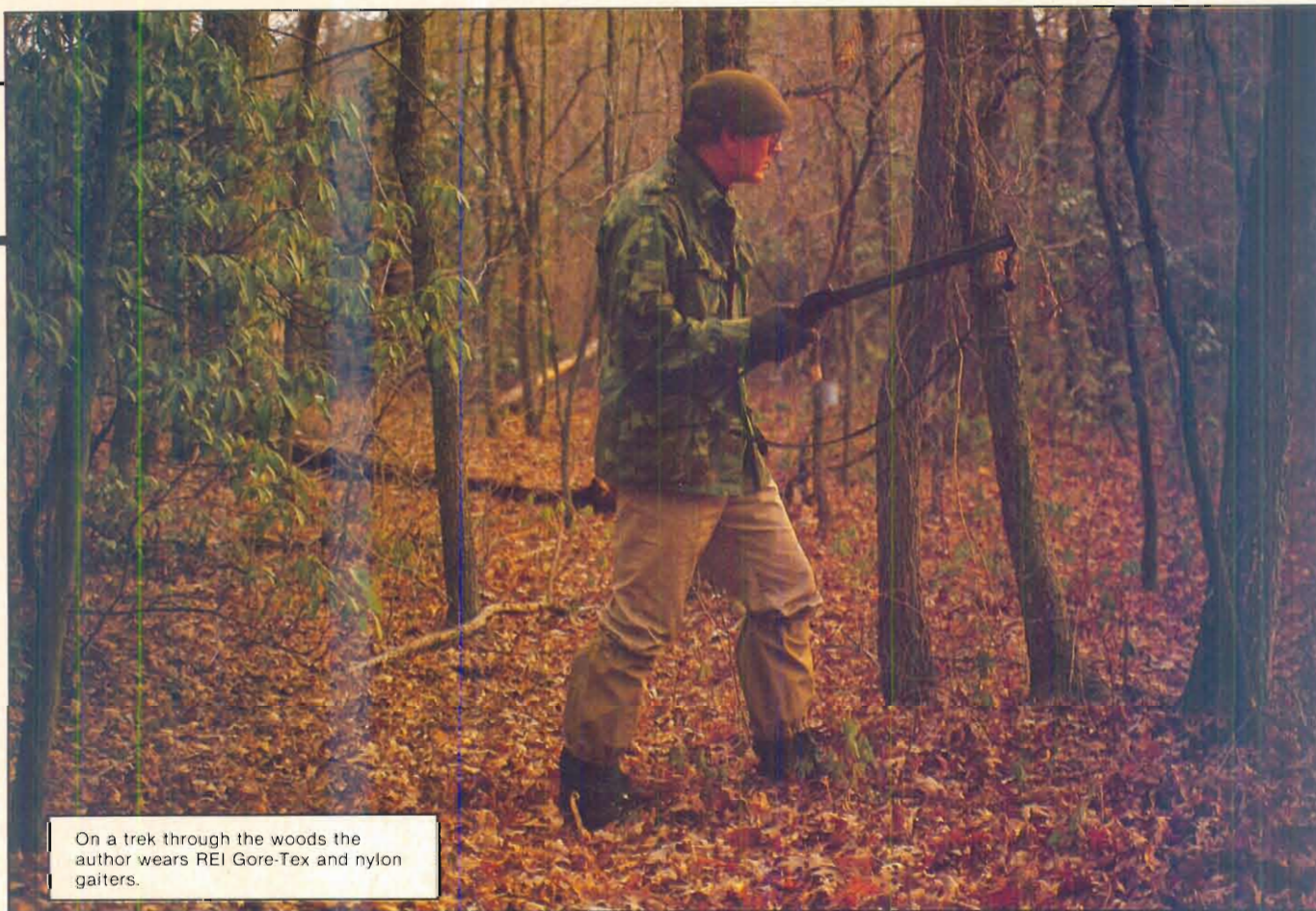
GORE-TEX is the latest and perhaps the most dramatic of the modern fabric breakthroughs which begin only a couple of decades back with the various permutations of nylon and the poly/cotton blends.

Gore-Tex, a patented term, by the way, is different from all that went before it in that it is as waterproof as coated fabrics, but as breathable as cotton. This "one way street" is possible because of the unique molecular structure of Gore-Tex. It employs a microporous film which can be laminated to any number of different sorts of fabrics. This film, with nine billion pores per square inch, can tell the difference between water as a vapor (individual molecules), and water as a liquid (hundreds of thousands of molecules bonded in each drop).

The vast number of tiny pores of the Gore-Tex laminate allows for the passage of water vapor because the pores of Gore-Tex are something like 700 times larger than a water molecule, but it shuts out liquid water, since each drop is several thousandfold larger than a Gore-Tex pore.

It means that the wearer of a Gore-Tex parka or outer jacket sweats out in the rain, but the rain doesn't get in.

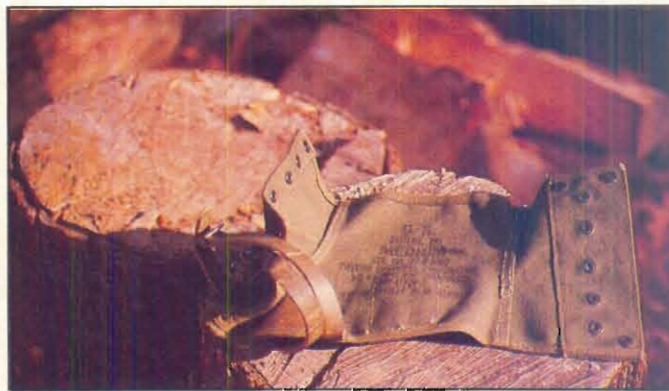
Later generations of Gore-Tex are now on the market, and are extremely effective. The first stuff which came along was prone to delaminating when it got dirty in the field, but the new Gore-Tex has a much better track record in this regard. It goes without saying, of course, that any Gore-Tex garment should be kept as clean as possible for best performance, and the best way to do it is by machine washing and tumble drying. ●



On a trek through the woods the author wears REI Gore-Tex and nylon gaiters.



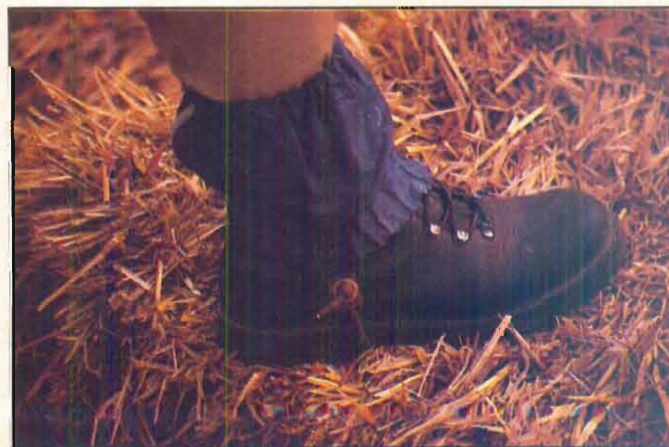
Here are several types of gaiters.



This is one of a pair of surplus G.I. ski gaiters.



A close-up of the author's REI gaiters reveals how they can be snugly fitted to the wearer's legs.



These low gaiters are used for rock climbing, scree rummaging or desert walking.

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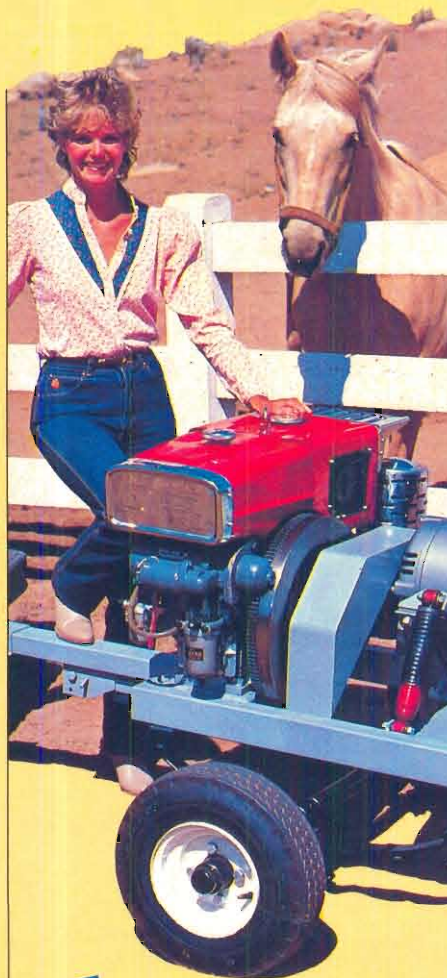
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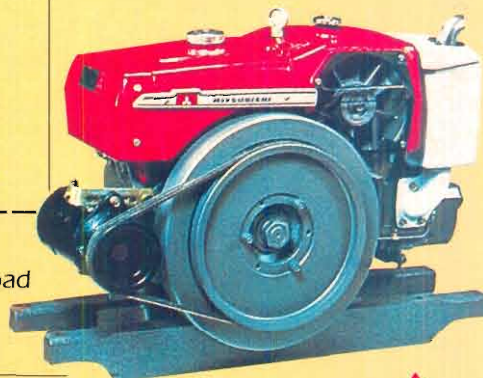
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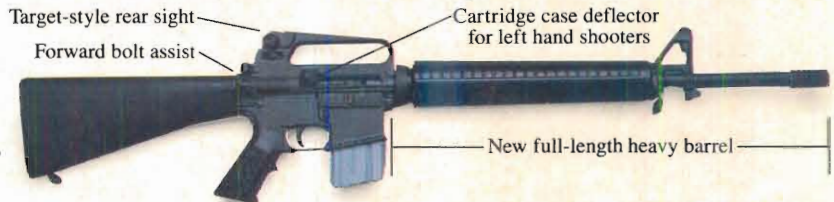
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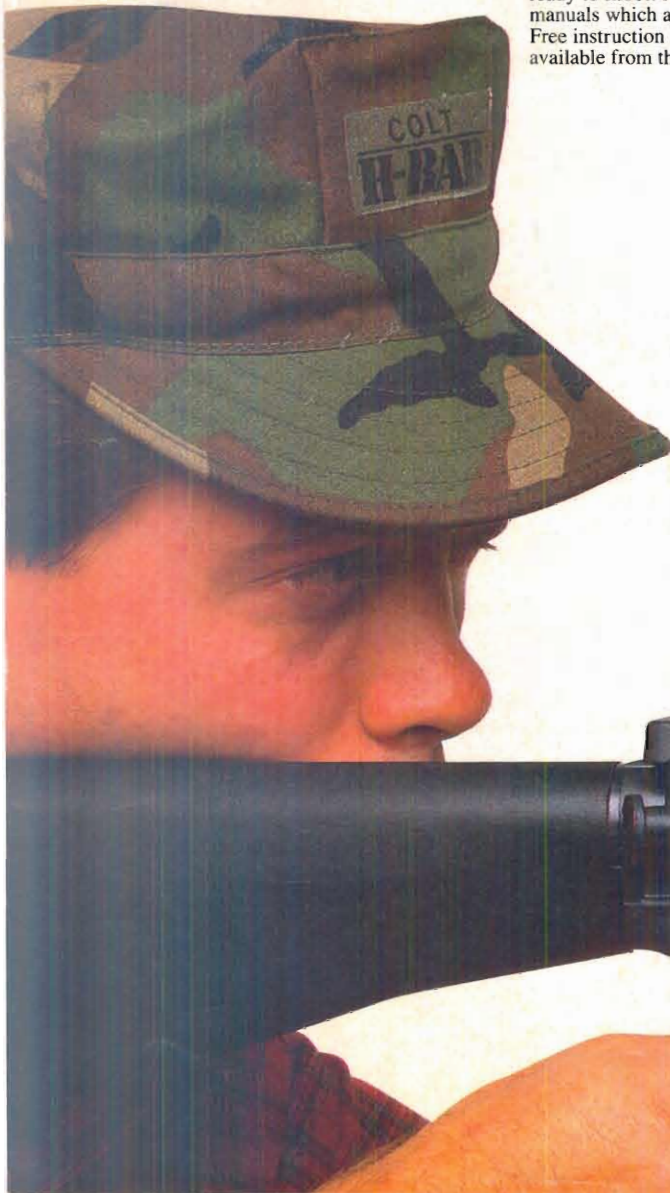
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